REPORT OF THE

Eleventh Industrial Exhibition

Mechanics' Institute.

1876.

Presented by the Society.

JAMES C. PATRICK

REPORT

OF THE

Eleventh Industrial Exhibition

UNDER THE AUSPICES OF THE

Mechanics' Institute

OF THE

City of San Francisco,

Held at the Mechanics' Pavilion, Mission and Eighth Streets, from the 8th day of August to the 16th day of September, 1876.

LEO ELOESSER, Steam Book, Card and Job Printer,
414 Clay Street, San Francisco.
1876.

BOARD OF MANAGERS

OF THE

Eleventh Industrial Exhibition

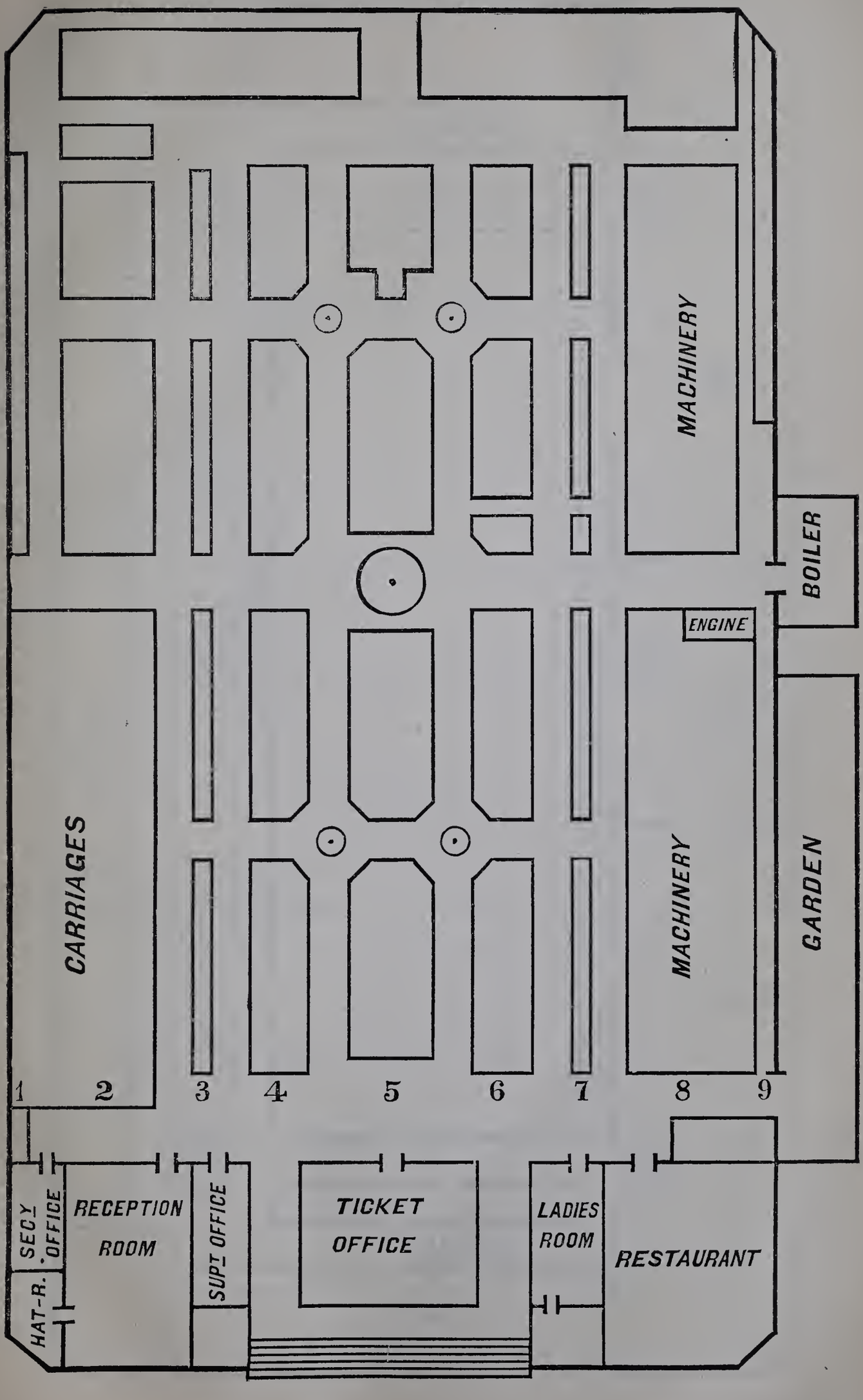
UNDER THE AUSPICES OF THE

Mechanics' Institute,

1876.

A. S. Hallidie, President.	P. B. Cornwall, Vice-President.
Henry L. Davis, Treasurer.	James Spiers, Cor. Secretary.
J. H. Culver, Recording Sec'y.	J. H. Gilmore, Superintendent.
James C. Patrick,	Asa R. Wells,
George Spaulding,	Charles Elliot,
D. E. Hayes,	J. H. Stoutenborough,
H. S. Smith,	Jeremiah Browning,
James Drury,	J. B. Stetson.

Ground Plan of the Mechanics' Pavilion.



Plan of the Mechanics' Pavilion—Gallery.

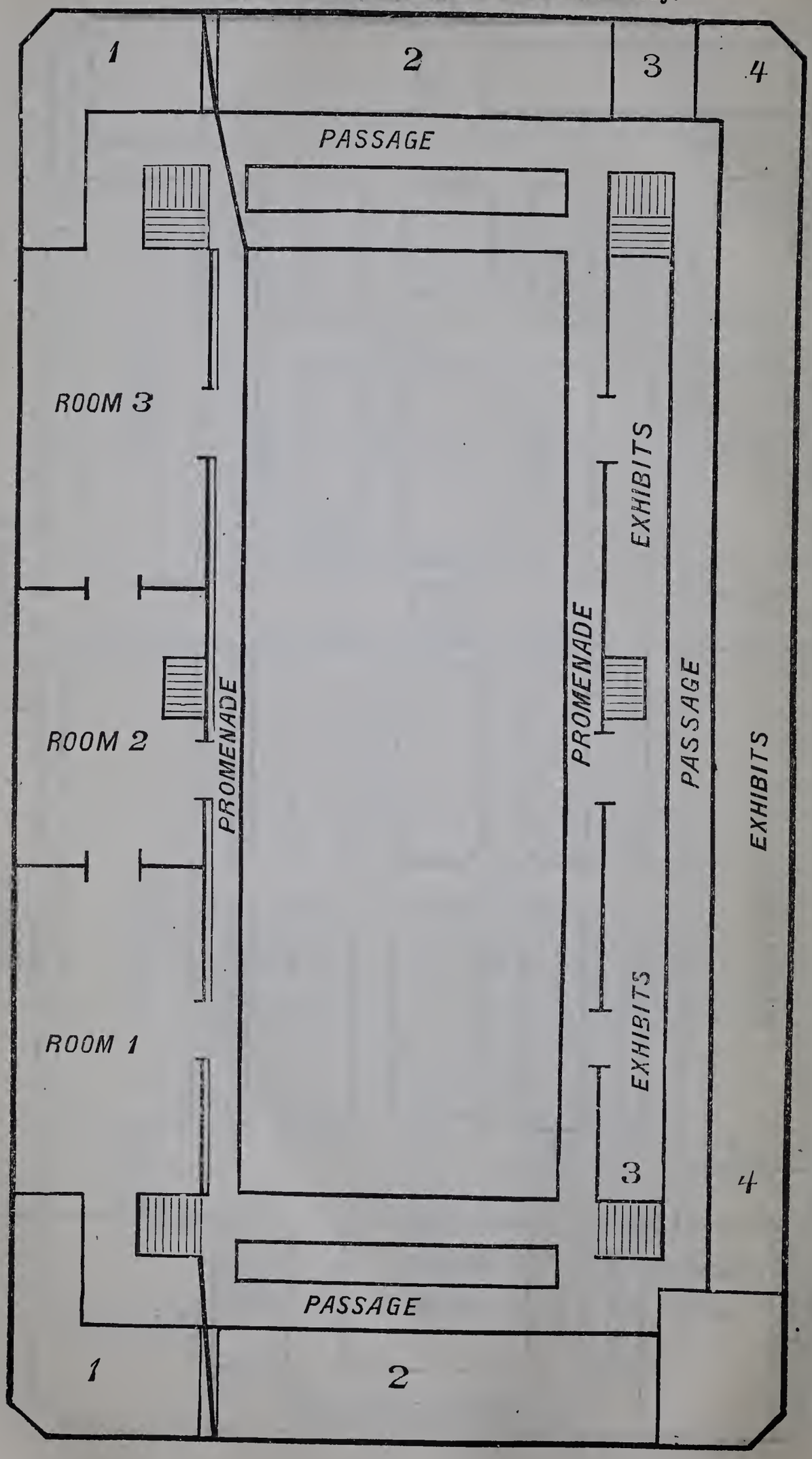


TABLE OF CONTENTS.

PAGES.

Address by the President, A. S. Hallidie 21– 27
Art Department, Catalogue of 90– 99
Classification of Exhibits 100
Division I—Minerals, Mineral Products and Manufactures 102–108
" II—Vegetable Products 129–135
" III—Animal Products 140–145
" IV—Manufactures from Wood, wholly or in part 151–156
" V—Chemical and Pharmaceutical Products 168–173
" VI—Machinery 178–183
" VII—Wines and Liquors 205–210
" VIII—Pomological and Horticultural 211–216
" IX—Fine and Liberal Arts 219–223
Engines 183
Exhibits, Alphabetical List of 46– 89
Exhibitors, Classified List of 40– 45
Horticultural 219
Journal of Commerce 228
Loans Repaid 14
Managers, Report of 1– 4
Mechanics' Fair Daily Press 228
Needlework 230
Notice to Exhibitors 101
Opening Exercises 21
Oration by Henry Edwards, Esq 29– 39
Photography 226
Poem by Hon. Frank Soulé 27– 29
Preliminary Announcement Eleventh Exhibition 17– 18
Preliminary Announcement Twelfth Exhibition 231–232

PAGES.

Report on Exhibits in Division I.....108–129
" " " " II.....135–140
" " " " III.....146–151
" " " " IV.....156–168
" " " " V.....173–177
" " " " VI.....183–204
" " " " VII.....210–211
" " " " VIII.....216–219
" " " " IX.....224–230
Report of Committee on Oil Paintings.....224–226
Rules and Regulations.....18– 19
Standing Committees.....20
Statuary.....227
St. Ignatius College.....202–204
Ticket Account.....5– 6
Treasurer's Report.....7– 16
Wines and Liquors.....210

REPORT OF THE BOARD OF MANAGERS

OF THE

ELEVENTH

INDUSTRIAL EXHIBITION,

UNDER THE AUSPICES OF THE

MECHANICS' INSTITUTE, 1876.

To the Board of Trustees of the Mechanics' Institute:

The labors of the Board of Managers having charge of the Eleventh Industrial Exhibition being now closed, it has the honor to present to the Trustees of the Mechanics' Institute, and the public, a report of its proceedings and an account of its stewardship.

The experiment of three consecutive Annual Exhibitions was made with some misgivings, but with considerable hope of success, and perfect confidence in the generosity of the public. Heretofore, no more than two Industrial Exhibitions have been held consecutively, and it was a question on the part of many whether it was policy, under any circumstances, to attempt to hold a Third Annual Exhibition, especially in view of the fact that Philadelphia would be the center of attraction for all who were able to visit that city and the Centennial Exhibition. However, the Managers had on their hands a costly Exhibition Build-

ing, the maintenance of which envolved an annual expense of about $5,000, and there remained an unpaid balance due to citizens who had assisted in its construction, amounting to $29,064.65, and besides, the lease of the ground on which the building stands, expiring December 31st, 1879, it seemed imperative that extraordinary efforts should be made to hold a successful Exhibition in 1876. It was, too, the opinion of many of the leading citizens of the State, that it would be a benefit to the City and State if such an Exhibition should be held.

At a meeting of the Managers held, it was finally decided to hold such an Exhibition, and public announcement was made to that effect.

Feeling that holding Annual Exhibitions was a new departure, the Board determined to keep all expenses down as low as possible, but nevertheless to redouble their energies and make the Exhibition more than usually attractive, and no efforts were spared to this end.

In order to insure excellence in the music and give pleasure to the public, Mr. Rudolph Herold was commissioned to organize an orchestra, which he did most successfully and satisfactorily. The building was also decorated in a manner appropriate to the One Hundredth Anniversary of the Nation's birth; the Garden was improved and beautified; and extraordinary efforts were made to have the machinery department complete in all its details. In this latter the Board was not as successful as they anticipated, owing to circumstances beyond their control; but on the whole the Exhibition was excellent and fully up to the standard of its predecessors. The members of the Board, the Secretary and Superintendent, knowing they were trying an experiment, exerted themselves to the utmost, and on the 8th day of August the opening exercises were held at Wade's Opera House, (now called the Grand Opera House,) Mission Street, and the Exhibition was duly opened the same evening.

Unfortunately, the "small-pox," which had been lurking around the city, broke out in the form of an epidemic, and

entirely stopped all excursionists or visitors from the country coming to the city, and it is fair to assume that this alone made a difference of $10,000 to our receipts.

In spite, however, of all obstacles, the Exhibition was a success in every respect, financially and as an Exhibition, and from the accompanying financial report, it will be seen that it has realized a profit of $25,116.99, enabling the Board to pay off loans to the amount of $20,274.62, and pass over $5,842.37, to the Pavilion account, leaving an indebtedness of $8,549.28, to carry over to the next Exhibition.

During the whole term of the Exhibition everything passed over in perfect harmony, and the Managers acknowledge their indebtedness to the Secretary and Superintendent for their efficiency and untiring watchfulness, and to the excellent service rendered by the various watchmen and other employees around the building.

It is pleasing to know that the exhibitors were satisfied with the Exhibition and expressed, generally, their intention of being represented again in 1877.

Many of our most successful manufacturers trace the turn of the tide in their favor directly to these Exhibitions, and certainly there can be no better way for a manufacturer to place himself before the public, than by means of these Industrial Exhibitions. Moreover they arrest the attention of adjacent nations and visitors therefrom, and thus open up new avenues for trade and industrial commerce.

The Board of Managers are under deep obligations to many friends for courtesies extended during the Exhibition, among whom are Mr. Bert, for use of Wade's Opera House; the Aimèe Opera Troupe for coöperation in the opening exercises, to Mr. Vinson for material aid in the tableau at the same.

To Messrs. Hinckley & Co., of Fulton Foundry, for use of the fine engine used in driving the machinery.

To Wm. T. Garrett, Esq., for use of bells and pump; to U. S.

Quartermaster Department, for loan of flags; to A. L. Fish & Co., for the loan of a steam feed pump; to J. M. Keeler & Co., for the loan of iron statuary; to J. B. Owens for the loan of vases; to Murray Davis for loan of a clock, and to Jonathan Kittredge for the loan of safe.

(Signed,)

A. S. HALLIDIE, President.
P. B. CORNWALL, Vice Pres.
HENRY L. DAVIS, Treasurer.
JAS. SPIERS, Cor. Secretary.
DANIEL E. HAYES.
JAMES C. PATRICK.
ASA R. WELLS.
GEORGE SPAULDING.
H. S. SMITH.
J. B. STETSON.
JAS. DRURY.
CHARLES ELLIOT.
J. H. STOUTENBOROUGH.
JEREMIAH BROWNING.
J. H. CULVER, Secretary.

FINANCIAL STATEMENT OF THE ELEVENTH INDUSTRIAL EXHIBITION.

MECHANICS' INSTITUTE,
SAN FRANCISCO, November 28, 1876.

To the President and Board of Managers of the Eleventh Industrial Exhibition:

GENTLEMEN—Herewith I submit my report of the Receipts and Disbursements on account of the Eleventh Industrial Exhibition of 1876; also of the Pavilion Fund, and a Ticket report showing each class, and by whom sold.

Yours respectfully, HENRY L. DAVIS, Treasurer.

DAILY RECEIPTS AT THE DOOR.

1876.	Double Season Tickets.	Single Season Tickets.	Children's Season Tickets.	Adult Single Admission Tickets.	Children's Single Admission Tickets.	Excursion Tickets.	Amount.
August 8	561	155	128	753	30		$3,846 00
" 9	246	92	55	347	23		1,767 75
" 10	226	60	53	457	35		1,626 75
" 11	208	67	30	449	34		1,519 00
" 12	418	106	78	1,564	240		3,367 00
" 14	145	39	38	662	56		1,244 00
" 15	167	50	21	892	56		1,476 50
" 16	139	31	14	1,038	55		1,341 75
" 17	120	36	14	1,026	82		1,262 50
" 18	91	21	19	981	55		1,050 75
" 19	162	66	29	3,357	554		2,868 50
" 21	43	17	5	854	72		718 50
" 22	35	12	6	1,023	80		751 50
" 23	39	6	6	1,313	72		896 50
" 24	29	13	2	1,238	88		828 00
" 25	26	3		1,057	110		695 00
" 26	64	8	4	3,998	745		2,535 25
" 28	10	4	4	917	69		543 75
" 29	6	6	1	935	51		529 75
" 30	9		1	1,238	102		691 00
" 31	9	1		1,238	79		686 75
September 1	4	1		906	82	16	500 50
" 2	10	1	1	3,330	600		1,869 50
" 4	1	1	1	544	46		293 00
" 5	1			817	62		429 00
" 6	2	2		918	29		482 25
" 7	1			786	74		416 50
" 8		2		783	53		410 75
" 9		1		2,595	401		1,400 75
" 11			1	620	58		326 00
" 12				989	102		520 00
" 13				1,111	78		575 00
" 14	1			1,326	117		697 25
" 15				1,491	122		776 00
" 16				4,047	506		2,150 00
Totals	2,773	801	511	45,600	5,018	16	$41,093 00

ACCOUNT OF TICKETS SOLD, AND BY WHOM.

NAMES.	Double Season Tickets, $5 each.	Single Season Tickets, $3 each.	Children's Season Tickets, $1.50 each.	Adult Single Admission Tickets, 50 cts. each.	Children's Single Admission Tickets, 25 cts. each.	Excursion Tickets, 25 cts. each.	Amount.
Henry L. Davis, Treas..	2,773	801	511	45,600	5,018	16	$41,093 00
G. C. Hurlbut	262	58					1,484 00
A. S. Hallidie	166	39					947 00
H. S. Smith	166	29	6				926 00
Jeremiah Browning	134	15					715 00
Sherman & Hyde	122	7					631 00
Anderson & Randolph	117	12					621 00
James Spiers	97	8					509 00
George Spaulding	92	12					496 00
Daniel E. Hayes	84	11					453 00
Asa R. Wells	73	6	5				390 50
A. J. Haight	50	15					295 00
Braverman & Levy	48	9					267 00
Charles Elliot	45	4					237 00
Union Iron Works	34	16					218 00
M. Gray	39	7					216 00
J. H. Stoutenborough	37	4					197 00
A. L. Bancroft & &o	34	6					188 00
J. H. Culver	32	7					181 00
W. K. Vanderslice & Co.	26	11					163 00
James Drury	29						145 00
C. Beach	20	5					115 00
Wm. T. Garratt	18	7					111 00
Koehler & Ritter	14	7					91 00
A. Roman & Co.	15	5					90 00
J. B. Golly & Co	14	1					73 00
D. W. Laird	14						70 00
A. Andrews	12	6					78 00
James C. Patrick	9	6					63 00
Painter & Calvert	11	2					61 00
James B. Stetson	8	3					49 00
Kohler, Chase & Co	8	1					43 00
Hopps & Sons	8						40 00
Geo. C. Shreeve & Co	6	1					33 00
Bullock & Jones	4	1					23 00
Payot, Upham & Co	2	1					13 00
J. H. Gilmore		*215					322 50
Totals	4,623	1,338	522	45,600	5,018	16	$51,648 00

* Employees of Exhibitors at $1.50 each.

TREASURER'S REPORT.

FITTING AND DECORATING BUILDING.

FITTING—Brown, R. T., whitewashing	$40 00		
Brewster, J., 72 lights glass	37 50		
Campbell, painting	350 50		
Detrick, E. & Co., garden roof	359 63		
Day, Thomas, sprinklers' valves and stops	23 15		
Gratz, J. S., 4 glazed bottoms for reflectors	48 00		
Grubb, S. N., plumbing, labor and material	681 60		
Holbrook, Merrill & Co., pipe valve, bibbs and zinc	206 97		
Hanson, Ackerson & Co., lumber and battens	95 18		
Iredale, A. S., plumbing, labor and material	30 15		
Josselyn, G. M. & Co., 45 lbs. manila	6 52		
Joost Bros. & Co., hardware	29 31		
Kittredge, E. H. & Co., sashes and doors	134 50		
Muller, F. W., wrenches and bracing gas letters	25 00		
Macdonald, D. A. & Co., mill work	12 00		
Pay roll carpenters	807 50		
Patrick, R. & Co , hardware	20 43		
Rosekrans, H. & Co., hardware	15 25		
Sperling, C , labor in garden	9 00		
Savage & Son, 2 ventilators and labor on same	9 90		
San Francisco Gas Light Co., service pipe	57 00		
Wilson, J. N., whitening	23 00		
Whittier, Fuller & Co., glass	13 50		
Wells, Russell & Co., lumber and mill work	618 73		
Wilcox, J. R., bracing frame of garden	48 50		
			$3,702 82
FURNITURE—Bell, Gullixson & Co., oil cloth, matting, laying carpet	189 05		
California Electric Power Co., 8 electric bells and running wires	342 00		
Miller, J. M., hire show cases and repairs, damages to same	32 00		
Unna, Jacob	28 50		
			591 55

PLANTS FOR GARDEN—Culver, J. H., pond lilies and barley	$2 85	
Leonard, J. H., plants	9 00	
Miller, Sievers & Co., plants	215 15	227 00
MACHINERY—Garratt, W. T., engine connections	116 96	
Grubb, S. N., plumbing	79 75	
Holbrook, Merrill & Co., globe valve	60	
Hammond, J., lining main shaft and erecting engine	503 29	
Hinckley & Co., engine connections	242 97	
McCoy, D., cartage, engine and rock	53 75	
Simmons, W., painting smoke stack	21 00	1,018 32
DECORATIONS—Belcher, F. P., moving machines of St. Ignatius College	40 00	
Brideson, W., carting pictures	72 75	
Bachman Bros., bunting and star print	6 87	
Barbier, A., general decoration of building	441 15	
Culver, J. H., freight and charges on evergreens and cartage, flags and pictures	51 00	
Crawford, A. & Co., 2 36-feet ensigns and 1 flag "Mechanics' Institute"	220 00	
Coleman, D. R., 3 iron rings	8 50	
Davis, H. L., paid for decorations	9 50	
Daniels, J., framing drawings and sketches	6 00	
Edwards, F. G., picture frame mouldings and repairs	33 00	
Figer Bros., picture duster	4 50	
Goodwin & Co., 53 yds. American jack cloth	4 24	
Gump, S. & G., 310 feet gilt moulding	15 50	
Grubb, S. N., labor and material for fountains	88 85	
Hopps & Sons, 2 signs for Art Gallery	10 00	
Joseph, J., cartage pictures	6 00	
Miller & Sievers, plants for fountains	82 50	
Martin, J. R., sundry disbursements for Art Gallery	7 00	
Masseth, M., cartage pictures	63 75	
Mission Express, cartage vases	3 00	
Myers, L. R. & C., use of fountains	75 00	
Neri, Jos. M., electric light exhibition expenses	645 00	
Otto, C., hardware for Art Gallery	10 35	
Patrick, R. & Co., hardware for Art Gallery	18 05	
Robison, A. C., 100 gold fish	20 00	
Strauss, L. & Co., flags, shields and print	80 98	

Sachs, L. & M. Co., flags and muslin	$12 00	
Samuels, D., flagging and calico	22 60	
Swan & Brooks, signs, shields, painting St. Ignatius engine and fountains, picture of Abe Lincoln	297 68	
Underhill, A., 2 car loads evergreens	110 00	
Vanni, N. & Co., cartage pictures	45 00	
		2,510 77

RUNNING EXPENSES.

LIGHT—Grant, G. M. & Co., 1,040 gals. gasoline		319 50	
Pacific Gas Carbureting Co., use of carbureters		145 80	
San Francisco Gas Light Co., 1,155,500 feet gas, at $3.75	$4,333 20		
Less discount of 75 cts. per M. on 1,154,200 feet	$865 65		
Less amount received from exhibitors	115 86	981 51	
		3,351 69	
San Francisco Gas Light Co., setting one 150 light meter		30 00	
Yates & Co., 5 gals. alcohol and 1 ball wick		13 00	
			3,859 99
WATER—Spring Valley Water Co., water $5\frac{5}{6}$ weeks at $100			583 33
PRINTING AND STATIONERY—Bancroft, A. L. & Co., stationery		$25 05	
Buswell, A., cards and hat tickets		12 00	
Britton, Rey & Co., 10,000 tickets and altering plate		95 88	
Bosqui, E. & Co., cards, tickets and art catalogues		150 75	
Culver, J. H., stationery		21 15	
Cubery & Co , programmes and postal cards		101 00	
Dutton & Withington, stationery		14 00	
Davis, H. L., Treasurer, stationery		2 00	
Eastman, F., printing		70 50	
Eloesser, Leo, tickets, contracts, cards, posters and programmes		146 50	
Eitner, R., wood cut		10 00	
Francis & Valentine, placards		19 50	
Gordon, C. W., cards, notices and gas reports		22 50	
Hodge, J. G. & Co., 1 stamp, "ordered paid"		12 50	
Hicks, D. & Co., register and receipts		12 50	
Kane & Cook, receipts, envelopes, postal cards			

and circulars	38 00	
LeCount Bros., stationery	10 00	
Murdoch, C. A. & Co., 300 cards, 100 classifications	18 50	
Remington, A. D., 112 sheets green and yellow paper	7 84	
Scientific Press Engraving Co., engraving plan and 8 letters	21 00	
Sterrett, B. F., 800 posters	35 50	
Thomas & Co., 1,000 catalogues and order book	174 50	
Women's Printing Co., show cards, circulars and envelopes	10 50	
	$1,031 67	
Less receipts from sale of catalogues	130 55	
		901 12

ADVERTISING—Alta	$96 50	
Abend Post	24 00	
Bulletin	123 00	
Call	164 75	
Chronicle	172 50	
California Demokrat	22 00	
California Farmer	25 00	
Examiner	98 25	
Mechanics' Fair Daily	200 00	
Mining and Scientific Press	62 00	
News Letter	10 00	
Oregonian	15 00	
Pacific Appeal	10 00	
Post	111 50	
Rural Press	62 00	
Stock Report	10 00	
Stock Exchange	10 00	
Virginia Enterprise	18 75	
Woodward's Garden's Advertising Agency	10 00	
3 other papers, $4 each	12 00	
14 " $5 "	70 00	
5 " $6 "	30 00	
5 " $8 "	40 00	
Posting in city, 7 weeks	70 00	
" Stockton, Sacramento, Vallejo, Napa, Santa Rosa, Petaluma, Redwood, Santa Clara, San Jose, and way towns	35 00	
		$1,502 25

SALARIES AND WAGES—Superintendent	$1,191 00	
Secretary	726 00	
Clerks	848 00	
Bookkeeper	200 00	
Police, Watchmen, Janitors, Messengers, and Laborers	5,778 37	
		$8,743 37
MUSIC—R. Herold	$4,843 50	
Moving organ	200 00	
		$5,043 50
FUEL—Black Diamond Coal Mining Co., Sydney Coal	$462 80	
Flynn, J., Sydney and Scotch Coal	21 97	
		$484 77
EXPENSE ACCOUNT—Aimy, O. M., exhibition Yaqui Indians	$95 00	
Bert, F. W., expenses of opening at Wade's Opera House	91 00	
Corbett, P. J., horse and buggy hire, 7 days	17 50	
Culver, J. H., petty expenses	142 25	
Cartwright, D. S., carting gas sign	2 50	
Davis, H. L., Treasurer, petty expenses	11 50	
Francis & Valentine, Directory	5 00	
Gilmore, J. H., petty expenses	22 92	
Gilmore, J. H., fruit display	96 30	
Hurlbut, G. C., postage stamps	4 60	
Mechanics' Institute, express charges on reports and circulars	23 50	
Miller & Sievers, exhibition of plants	80 00	
Seventh St. Livery Stable, hire horse and buggy 18 days, @ $2.50	45 00	
Seregni, F., engrossing resolutions and filling up diplomas, 10th Exhibition	11 20	
Tweedale, T. S., Janitor, petty expenses	25 95	
Vanderslice, W. K. & Co., goblet for presentation to R. Herold	46 00	
Wheeler, S. H., plans for location committee	38 00	
Wade, W. N., carriage hire	87 50	
		$845 72

CONTINGENT EXPENSES.

DISCOUNT—Davis, H. L., Treasurer, discount on $30,000 silver sold. (All bills for insurance, taxes and street repairs, have been paid from the Pavilion Fund.)		$1,877 50
		$31,892 01

RECAPITULATION.

REVENUE.

Sale of Tickets	$51,648 00	
Sale of Privileges	5,361 00	
		$57,009 00

EXPENDITURES.

FITTING AND DECORATING—General alterations and repairs	$3,702 82	
Furniture	591 55	
Plants for Garden	227 00	
Machinery	1,018 32	
Decorations	2,510 77	
		$8,050 46
RUNNING EXPENSES—Lights	$3,859 99	
Water	583 33	
Printing and Stationery	901 12	
Advertising	1,502 25	
Salaries and Wages	8,743 37	
Music	5,043 50	
Fuel	484 77	
Expense Account	845 72	
		21,964 05

CONTINGENT EXPENSES—Discount on Silver coin	$1,877 50	$31,892 01
Profit		$25,116 99

RESUMÉ.

Profit of 11th Industrial Exhibition		$25,116 99
Received from transfer from Pavilion Fund		1,000 00
		$26,116 99
Loans paid	$20,274 62	
Cash on hand	5,842 37	
	$26,116 99	
The indebtedness remaining from last exhibition was		$29,064 65
Paid this year from Fair moneys	$20,274 62	
" " " Pavilion fund	240 72	20,515 37
Leaving an indebtedness at end of 11th exhibition of		$8,549 28
Against which, there is cash on hand amounting to		5,842 37

LOANS REPAID.

Spring Valley Water Works.	$1,000 00	R. Patrick & Co	$250 00
San Francisco Gas Light Co.	1,000 00	Redington, Hostetter & Co.	250 00
Preston & McKinnon	1,761 05	Pacific Saw Co	250 00
B. & J. S. Doe	972 00	Pilsbury, Webb & Co	250 00
Union Insurance Co	500 00	Nelson & Doble	250 00
Home Mutual Ins. Co	500 00	Crane & Brigham	250 00
Donohoe, Kelly & Co	500 00	L. Rosener	250 00
Parrott & Co	500 00	Real Estate Associates	250 00
Commercial Insurance Co.	500 00	Linforth, Kellogg & Co	250 00
G. C. Johnson	500 00	Pacific Cordage Co	250 00
Firemans' Fund Ins. Co	500 00	H. H. Pearson	250 00
T. H. Selby & Co	500 00	W. T. Garratt	250 00
G. B. Knowles	500 00	M. C. Hawley & Co	250 00
T. Bell	500 00	W. Norris	250 00
State Investment Ins. Co.	500 00	Pacific Rolling Mill	166 57
A. A. Cohen	500 00	Allyne & White	150 00
Hanscom & Co	250 00	Schultz & Van Bergen	150 00
Baker & Hamilton	250 00	Sullivan, Kelly & Co	150 00
Locke & Montague	250 00	Hickox & Spear	150 00
R. Watt	250 00	A. B. Forbes & Co	150 00
Britton, Holbrook & Co	250 00	S. L. Jones	150 00
Conroy, O'Connor & Co	250 00	Farwell & Co	150 00
Kittle & Co	250 00	Wellman, Peck & Co	125 00
W. T. Coleman & Co	250 00	S. H. Seymour & Co	125 00
A. Dibblee	250 00	A. Austin	125 00
Tubbs & Co	250 00	J. Taylor & Co	125 00
Hinckley & Co	250 00	Sather & Co	125 00
Huntington, Hopkins & Co.	250 00	C. Waterhouse	100 00
Glasgow Iron and Metal Importing Co	250 00	S. S. Smith	50 00
Hanson, Ackerson & Co	250 00	H. Rosekrans	50 00
Merchants' Exchange Bank	250 00	Whittier, Fuller & Co	240 75
California Furniture Co	250 00		$20,515 37

PAVILION FUND.

RECEIPTS.

Rents—Skating Rink	$275 00	
Dr. Cunningham's Church	210 00	
A. Badlam	550 00	
California Guard	350 00	
A. C. Kimball	100 00	
Fassking & Co	125 00	
P. S. Gilmore	1,250 00	
D. O'Leary	1,230 00	
Centennial Church	70 00	
Cooper, Bailey & Co	40 00	
Anti-Coolie Union	75 00	
		$4,275 00
Use of canvas and lumber		35 00
Cornell Watch Factory, privilege, etc., Tenth Exhibition		215 25
Lumber, wood, etc., sold		37 10
		$4,562 25
Received Transfer from Tenth Exhibition		5,801 88
		$10,364 23

DISBURSEMENTS.

Bartling & Kimball, bookbinding	$17 25
Brown, G. T. & Co., lithographing report	108 50
Britton & Rey, lithographing	80 00
Bills Payable, loan repaid, Whittier, Fuller & Co	240 75
Culver, J. H., compiling report Tenth Exhibition	400 00
Culver, J. H., petty cash	131 40
Dowling, P., street assessment, cor. Market and Eighth streets	194 92
Eloesser, Leo, printing 1,500 copies report Tenth Exhibition	527 64
Estee & Boalt, counsel fee	25 00
Fletcher & Day, decorations	89 75
Garratt, W. T., pipe, fitting, etc	269 57
Heney, W. J. & Co., walnut chair	15 00
Insurance	1,480 75
Lochbaum, A. H. & Co., medal cases	55 30
McCreery, A. B., taxes 1875–6, on pavilion lot and improvements	3,431 49
McCreery, A. B., rent of pavilion lot to Jan. 1, 1876, 24 months	24 00

Myers, L. R., use of fountains and vases	$75 00	
Pay Roll, alteration to building, putting up partition	571 24	
Pendergast & Smith, work on pump	5 00	
Spring Valley Water Works, water Dec. 1 to May 31	34 00	
Seregni, F., filling in diplomas and certificates	96 82	
Simmons, Mrs. L., material for Carnival Ball, 1875	144 00	
S. F. Gaslight Co., gas	129 10	
Tweedale, T, S., wages as janitor, Nov. 15, 1875, to July 15, 1876, and Sept. 15 to Nov, 15, 1876, 10 months, at $90 per month	900 00	
Ten Cent Package Delivery, delivering packages	4 25	
Tweedale, T. S., petty cash for labor in garden, etc.	48 40	
Tax Collector, personal taxes, 1875-6	9 45	
Tristram, S., premium on Mission grapes	10 00	
Vanderslice, W. K. & Co, engraving medals	71 78	
Wilcox, J. R., labor	50 60	
Whittier, Fuller & Co., glass and putty	5 10	
		$9,245 46
Transfer to Eleventh Exhibition		1,000 00
Cash on hand		118 77
		$10,364 23

We hereby certify that we have examined the foregoing report and find it correct.

DANIEL E. HAYES,
GEORGE SPAULDING,
JEREMIAH BROWNING,
} *Auditing Committee.*

San Francisco, Dec. 5th, 1876.

PRELIMINARY ANNOUNCEMENT

OF THE

ELEVENTH INDUSTRIAL EXHIBITION

UNDER THE AUSPICES OF THE

Mechanics' Institute of San Francisco, 1876.

The Eleventh Exhibition, under the auspices of this Society, will be opened at 11 A. M. on the 8th day of August, and continue open at least one month thereafter.

The Managers would most respectfully call attention of Exhibitors to the superior facilities and inducements offered for the display of goods at the forthcoming Exhibition.

The Exhibition Building fronts on Market, Eighth and Mission streets, and is well lighted in every part, both day and night. As protection against fire, service pipes are distributed throughout the building, and a well organized fire brigade will be constantly on duty.

The Mechanical Department is furnished with sufficient line shafting for all purposes required, and will be propelled by an engine of ample power for every requirement. Steam and water will also be supplied to such machines and appliances as require it. This department will be under the supervision of a competent master mechanic.

The Horticultural Department has an area of 15,400 feet, constructed and laid out in the most approved modern style for the exhibition of fruits, plants, flowers, tropical trees and shrubs.

The Art Gallery is 50 feet wide by 400 feet long, lighted by the most approved skylights and reflectors.

At no other time, nor in any possible manner, can a person so advantageously display their goods to the public of this coast as at these Fairs of the Institute.

The attendance of visitors at the two last Exhibitions has averaged 12,000 per day, drawn from every part of this Pacific Coast, the Eastern States and Europe.

Manufacturers will find it greatly to their interest, when practicable to display the process of manufacture of whatever article or specialty they may exhibit, as nothing is more attractive or interesting to the general public, than to witness the labor of skillful hands, or the work of ingenious machinery, and it is hoped by the management that all exhibitors of machines will place them in motion, and, if possible, arrange them for regular work.

No better time or place can be had for the exhibition and sale of works of art, whether of native or foreign artists, than this Exhibition, as the Art Gallery is constantly thronged by lovers of Art.

The recent great development in the mineral resources of this and adjoining States, warrants the expectation that the display in this department will far exceed that of any previous year, both as regards ores, reduction processes and mining machinery.

Private parties or companies who wish to bring to notice new discoveries in minerals, or the product of the soil, should avail themselves of this opportunity.

The native and available woods of this coast will be made a special feature. The manufacture of furniture, carriages, etc., has assumed such proportions here that every person that has for sale any species or kind of wood should send specimens for inspection.

The Wine Department will be made specially attractive, and all associations and private parties who engage in the production of native wines are requested to send samples of *all* their varieties, so that visitors from the Eastern States and Europe can judge of their excellence.

All articles for exhibition, if arriving before the time for reception of goods at the Pavilion, will be received, and stored free of expense; but no freight or other charges will be paid by the Managers.

No charge of any kind whatever is made to exhibitors for space or a reasonable amount of power.

Blank applications for space, or any information, can be had by addressing Board of Managers, Eleventh Industrial Exhibition, 27 Post street, San Francisco.

Rules and Regulations of the Eleventh Industrial Exhibition, under the auspices of the Mechanics' Institute, San Francisco, 1876.

1. The Pavilion will be open for the reception of goods on Monday, July 25th. The Exhibition will be open to the public on Tuesday, August 8th, at 11 o'clock A. M.

2. Applications for space must be made on or before July 20th, stating character of exhibit, amount and kind of space required—wall, table or floor. And, if case, state length, width, and height of case. Blanks will be furnished for this purpose, and a clerk will be in attendance at the Library of the Mechanics' Institute, every day from 12 to 1, and 7 to 9 P. M.

3. All persons presenting articles for exhibition must have them registered by the Receiving Clerk, who will give a receipt for the same, which receipt must be presented when the articles are withdrawn, at the close of the Exhibition.

4. Articles intended for sale may be labeled accordingly, but cannot be removed until the close of the Exhibition, except by written permission of the Managers.

5. Steam power will be provided, so that machinery of all kinds may be seen in actual operation, and every facility possible will be given to exhibit working machinery to the best advantage.

6. The name of every article must be attached by the exhibitor to it.

7. Perishable articles will be received, or may be removed at any time during the Exhibition, with the consent of the Managers.

8. The most effectual means will be taken, through the agency of the Police and otherwise, to guard and protect the property on exhibition; and it will be the purpose of the Managers that all articles shall be returned to the owners without loss or injury. Still, all articles deposited will be at the risk of the owners.

9. In case of any misunderstanding, application may be made to the Managers or Superintendent, who will at all times be in attendance.

10. The Managers are desirous that articles should be presented early. Those from abroad, intended for exhibition, should be properly packed, and if not consigned to exhibitors' agent, must be marked "Managers of Eleventh Industrial Exhibition, San Francisco, Cal." All articles thus received, arriving too early, will be stored free of cost to the exhibitor, and the Managers will have them duly placed in proper position for exhibition. No freight charges will be paid by the Managers.

11. All articles will be for exhibition only, but when an exhibitor desires to have an article examined and reported upon, by obtaining the unanimous consent of exhibitors in the class to which the goods belong, or of the Board of Managers, and by notifying the Board of Managers, a competent committee will be appointed to examine and judge of its own special merit, and a certified copy of their decision will be given him in lieu of the usual premiums. All such notifications must be served on or before August 12th.

12. The height of exhibits shall be as follows: In the nave, all opaque objects, cases, or exhibits not to exceed six (6) feet in height, including cornice and signs. Signs not to exceed eight (8) inches, and cornices six (6) inches in width. All transparent cases or exhibits not to exceed ten (10) feet, including cornice and sign. In the wings and galleries, not to exceed ten (10) feet, except in the Machinery Department, where no rules can be laid down. On the partition and outside walls, all the height required may be used, but not to obstruct the light from the windows.

Information will be furnished by addressing Managers of Eleventh Industrial Exhibition, San Francisco, Cal.

STANDING COMMITTEES

OF THE

ELEVENTH INDUSTRIAL EXHIBITION

HELD UNDER THE AUSPICES OF THE

MECHANICS' INSTITUTE, 1876.

Auditing.

D. E. HAYES, GEO. SPAULDING, JERE. BROWNING.

Building.

JAMES DRURY, ASA R. WELLS, H. S. SMITH.

Circulars and Classification.

JERE. BROWNING, J. H. STOUTENBOROUGH, GEO. SPAULDING.

Printing and Advertising.

GEO. SPAULDING, P. B. CORNWALL, J. C. PATRICK.

Power and Machinery.

H. S. SMITH, JAMES SPIERS, CHAS. ELLIOT.

Rules, Regulations and Awards.

J. C. PATRICK, HENRY L. DAVIS, CHAS. ELLIOT.

Tickets and Admissions.

ASA R. WELLS, J. B. STETSON, P. B. CORNWALL.

Music and Decorations.

HENRY L. DAVIS, J. H. STOUTENBOROUGH, H. S. SMITH.

Privileges.

P. B. CORNWALL, J. B. STETSON, ASA R. WELLS.

Location.

JAMES SPIERS, JAMES DRURY, D. E. HAYES.

Police.

J. B. STETSON, D. E. HAYES, J. C. PATRICK.

Horticultural Garden.

J. H. STOUTENBOROUGH, H. L. DAVIS, JAMES DRURY.

Gas and Water.

CHARLES ELLIOT, JAMES SPIERS, JERE. BROWNING.

OPENING EXERCISES.

The opening exercises of the Eleventh Industrial Exhibition took place at Wade's Opera House, Mission street, on the afternoon of August 8th. There was fully 4,000 people present, the house being packed full from pit to dome.

The young ladies of the Girls' High School, who furnished the principal vocal music during the exercises, to the number of about five hundred, were seated on the stage in the rear of the Board of Managers, and were quite a feature of the exercises. They were all attired in different colored dresses, which, with the light background, presented a tasteful picture. They were selected according to their voices, and did excellent service under the directorship of Professor Elliott. Upon the stage also were A. S. Hallidie, President of the Mechanics' Institute, Rev. Elkan Cohen, Frank Soulé, Poet; Mr. Henry Edwards, Orator, and the invited guests.

The exercises commenced by an overture from the orchestra, after which the pupils of the High School sang an appropriate glee.

Rev. Dr. Elkan Cohn was then introduced by President Hallidie, and offered up a fervent prayer for the success and continuance of the Association, which was directed to the progress of science and everything which enobles the mind of man. He also invoked blessings upon the heads of the officers and Directors, in whose hands the labor of carrying out the objects of the Institute, that they may be enabled to bear out the sacred duty which devolves upon them.

Another song by the children, and then came the

OPENING ADDRESS OF PRESIDENT HALLIDIE.

Ladies and Gentlemen:—The Managers of the Eleventh Industrial Exhibition bid you welcome, that you may bear witness to the skill of the people, and the handicraft of the sons of industry and toil, desiring that in the exhibition hall you may be not so much impressed with the gaiety of the scene, or by the pleasure it may give the eye, as that what you see there may create an estimate of values in your mind, and having created, may build up an appreciation of these values that may influence you, and through you, generations to come.

SMALL BEGINNINGS OF THE MECHANICS' FAIR.

On the 7th of September, 1857, the first industrial exhibition was inaugurated in San Francisco, in a little building about the size of our present Art Gallery, erected on Montgomery street, where the Lick House now stands, and which,

at that time, was considered rather far out of town. Many of you have watched the progress of these exhibitions and the Mechanics' Institute with tender care, and from time to time have loaned money freely, and without interest, to tide over financial requirements. Let me say to you, free-hearted and noble-minded citizens of San Francisco, that this generosity is neither forgotten nor unappreciated. Up to the present time ten industrial exhibitions have been held. Not possessing lands on which to erect buildings adapted to the needs of the exhibition, the Managers have, from first to last, expended about $200,000 for temporary structures erected on leased ground. When we reflect upon the large sum thus outlayed, it seems singular that a permanent location has not been secured, and strange that these enterprises should have justified such large expenditures. This can only be understood when we remember that the people of San Francisco have always liberally supported these industrial exhibitions, and that the Managers have given time and thought to the careful administration of affairs in connection therewith, voluntarily and without recompense.

PERMANENT SITE NEEDED—PROSPECT OF PAYMENT OF DEBT.

But the time is near when it will be necessary to obtain a site on which a building suitable for these exhibitions can be erected for permanent use. In two years the lease of the ground occupied by the Pavilion expires, as its present terms, an extension of one year being allowed by the payment of a bonus of $7,500. It is believed, and hoped, that the present exhibition will relieve the Managers of debt, and enable them to refund to the public spirited citizens and corporations the balance due them on the loans they so generously made two years ago, for which no interest is asked, and on which one-half, so far, has been reimbursed, leaving an indebtedness remaining of $29,964.63.

VALUE OF INDUSTRIAL FAIRS TO SAN FRANCISCO.

It is difficult to estimate the value of these Industrial Exhibitions to a city like San Francisco, but it is not difficult to see many practical benefits that have resulted to the world of science, industry and art. Dating from the exhibition of 1857, the progenitor of this style of industrial exhibition, is an exemplification of the wonderful improvements made in the style of doing engineering and mechanical work, and the cultivated thought bestowed thereon. We have always had prominent examples of excellence in design and finish in many public works entrusted to special men, but the general tone of work in all the branches of art and industry has advanced enormously since the year of the first great international exhibition, and that is due to the direct and free interchange of observation and ideas between different nations and their representative men. For example, the massiveness and simplicity of machines of English make, and lack of beauty and design, the elegance, complicacy and extreme lightness of machines of French make, have both become modified, and the best of both are now found combined in each. So, also, in large public works, the best points of all such works, wherever

constructed, have been brought before the engineering world through these industrial exhibitions, and the world has the benefit of them. They have stimulated investigation, arrested thought, generated energy, broken down false pride, and, through inquiries suggested by facts developed, have liberalized the professions, and have endowed the arts and industries with a value heretofore unknown.

IS MAN'S MISSION THAT OF A MACHINE BUILDER?

When one wanders through the avenues of these industrial exhibition buildings, among the silent and expressive evidences of thought; through genius put in form and substance, involuntarily he wonders if man has a limit set to his work, and whether the mission of man in this age is not that of machine builder, giver of life to dead metal and energy to inanition. And it would seem when we witness the subtle motion and nervous activity of the mechanical parts of many a machine, that the Maker of all things, through man, had imparted to them the faculty of doing what man by means of his hands can do, and requiring but the aid of his senses to give them life and being. The ever restless spirit in man requires a channel through which his restlessness finds a counter-irritant, in the soothing influence of mental and physical occupation. The present age is favorable to invention, to commerce and economical industry, and thus preserves the man and builds up his faculties; on the other hand, if his energies were expended in war and bloodshed, or in pleasure and sensuality, invention, commerce and economic industries, would disappear, and man would lapse into semi-barbarism or degenerate into effeminacy or effeteness. Every citizen who sincerely and honestly wishes good to his country must recognize the potential influence of industry and honesty intelligently directed. To these ends are these industrial exhibitions dedicated, and their utility includes all this and more, and when taken in connection with the influence that Mechanic Institutes impart, the results cannot be other than good.

THE RELATION OF THE INDUSTRIAL FAIR TO THE INSTITUTE.

It may be proper here to state that however inseparable the Mechanics' Institute and these industrial exhibitions are connected, the Managers have endeavored faithfully by the distinct and separate organization of the two bodies to hold the Mechanics' Institute free from any possibility of loss, but the sole recipient of any profit. Twenty-one years ago last April the Mechanics' Institute was organized, and now having attained its majority, it comes before you in man's estate, happy in the esteem of the good citizens of San Francisco, invites you to visit its rooms and building, and examine its library, and will be glad to have you become a member of its family of over two thousand. It possesses a valuable library of 28,000 volumes of standard works of reference and instruction, and although representing the industries and the mechanic arts, its membership is free alike to all. Mechanics' Institutes, like industrial exhibitions, are devoted to the interests of the people, and are of the people, and their managers should desire the greatest good for the greater number in

all matters of public policy and private interests. The greatest good for the average man is that he should be educated to intelligently labor with the hands that God has given him, and to respect the rights of others to do likewise; and while the brain and mind is not neglected, the body should be cultivated.

PUBLIC EDUCATION.

And this, involving the matter of public education—the right and obligation of every citizen to receive its education from the government—brings home to the mind the inquiry that will flash across it, how far the State can justly carry its system of education in the ascending scale of special instruction; and how long will the people consent to be taxed when the school census is greater and money supply less, if the higher branches are to be forever included in the curriculum of public education? California may well be proud of her grammar and high schools and her Universities. She has done well to lay the foundations of these institutions deep and secure, so that they may last for all time to come. But having once fully endowed and fairly established them, it should be left, without affecting their fundamental principles of organization, to private good will and to those who receive the special benefits of the higher education, to provide for that which the State now supplies free.

THE KIND OF EDUCATION NEEDED.

I believe that every child is entitled to a good American elementary education in the national tongue, and the State should require that every child be so educated for the good of the State and the Republic. Simplify the course of instruction, teach habits of industry, sobriety and morality, and make labor to be respected. Take care that the school tax becomes not onerous. Educate as a neceesity, not as a luxury, and distribute the benefits of free tuition with a firm and impartial hand. After one hundred years of experimenting, it is time that our experience be carefully summed up, and the summing up be made in a spirit of true patriotism and broad benevolence, and if the line can be marked where no farther the State shall go in educating, then let those in the ascending scale of diminishing numbers support the high schools, the university, and such institutions across that line, and which may have been already established by the State.

THE GROWTH OF SAN FRANCISCO.

While the country rejoices that this glorious Republic has safely passed very many dangers of social and political character, and has attained its one hundredth year, we, in California, have additional cause for gratitude in the prosperity that has attended us throughout the twenty-six years of our tenancy, and for the goodness of God in planting American liberty on this Pacific coast, on such prolific soil, and preserving it here; but here, where the setting sun fringes with gold the shores of our beloved country, we have, as yet, scarcely a history—we have it all in our recollection: the past is

familiar to us, the present we realize, but who dares predict the future? The bare, unpoetic fact of the growth of this city outruns poetic license and shadows the tales of fairy-land. In less than the average age of man, three thousand miles west of the westernmost commercial city of America, has sprung into existence an American city, so famed for its commercial importance, its wealth, its depending resources, natural and industrial, that no traveler or tourist can sit down in the quiet of retiring life, and tell the tales of his traveling, unless he has visited it. Do you mourn the departed days of quietude and happy indifference of the Pueblo of Yerba Buena, when the dark-eyed Spanish maiden or the contented cock-fighting Padre held court and sway, with no interruption of their quiet except the excitement of a bull or bear tournament, and no dream of the future except the individual future, and no suspicion of the great destiny of that Pueblo? Or do you rejoice in the transformation of thirty years, and in the greatness of San Francisco, with its bustle, its business, its bulls and bears, its thousand stacks, with the countless industries rolling out in the expanding, ascending black smoke; the innumerable ships of steam and sail, riding at peace in the noble bay, from all parts of the world, waiting to receive or discharge cargo; its church spires and the religious feeling that created them; its libraries, its theaters, its hospitals, its civilization, and its Americanism, that stands on this western outpost of our common country, guarding its liberties like a sentinel at the gate of republican freedom?

THE INDUSTRIAL PROGRESS OF THE COAST.

This Industrial Exhibition suggests many thoughts in connection with the industrial progress of this coast. To the most casual observer there are two interests to which all others are subservient, and these interests are of such a character and extent as to attract the attention of the commercial communities of the world. The mines have been very productive and some have yielded such wonderful wealth, the amount of which almost staggers belief. The earth has yielded bountifully, so bountifully that it is estimated after providing sufficient breadstuffs for our people, there will be left to export for other countries, over 700,000 tons, or enough to load 700 ships of 1,000 tons burden each. Although the agricultural and mining interests predominate so greatly, other and lesser industries are taking root and thriving, and while we cannot lay claim, as yet, to the diversified industry possessed by other States, we are yearly becoming better prepared to meet our own requirements; to be independent of outside sources of supply, and to supply our neighbors.

OUR FOREIGN TRADE.

Our trade with Australia, Mexico, Hawaiian Islands, Japan, China, British Columbia and other foreign nations is increasing, and one of the most satisfactory evidences of our commercial growth is that of the 362,327 tons of shipping arrived in this port during the first quarter of the present year; 189,660 tons, over one-half, were from domestic Pacific ports, showing a re-

markable home commerce developed between the States and Territory of the Pacific side within the last fifteen or twenty years. It requires but little investigation to realize that this radical and satisfactory change in our commercial relations is due mainly to our increased facilities for manufacturing and producing; hence, if the results have been so satisfactory under the limited opportunities of the past, is it not a guarantee of prosperity and progress in the future, if these interests are legitimately nurtured and protected?

VALUE OF MANUFACTURING INDUSTRIES—DIFFICULTIES WITH WHICH THEY ARE BESET.

Every new manufacturing industry permanently established here is worth more to the State than the discovery of three of the richest gold or silver mines, for the developing and expanding of the former adds wealth to itself, but of the latter makes it poorer. Every citizen having the good of the State at heart, should encourage by means at his command the establishing of new branches of industry, and in order to provide for their maintenance, he should see to it that in the education of youth, and in the social influences that surround boys and girls, industry and honest labor should occupy a post of honor. The manufacturer, especially the small manufacturer, labors in San Francisco under very many difficulties, and his path is not always strewn with roses; his isolation creates difficulties of supply of raw material, and usually the legitimate requirements of his business, when once established, are beyond his financial ability to meet. The high rates of interest prohibiting the borrowing of money, the peculiarity of the import laws or customs, instead of protecting, often work a great hardship on him. The anomalous condition of the National and State currency is not calculated to improve the condition of the manufacturer, and the relation between silver and gold at this time is embarrassing to the manufacturer and unfair to his workmen.

ONLY ONE STANDARD OF VALUE NEEDED.

Common sense demands that there should be but one standard of value. All values are, however, relative, but the more stable that value is the better; and it seems reasonable to accept gold, as being less liable to fluctuate, as that standard. No effort of Government, backed by the loyal sentiments of the people, succeeded in making the dollar greenback equal in value to the gold dollar. Nor is it possible to make a debased silver dollar equal in value to a gold dollar, unless that is debased in the equivalent ratio. A great commercial and manufacturing country like this should have but one currency, an honest one, with no superior and national; a currency we should be as willing to receive for custom dues as to pay out for honest debts. With the return of metallic currency as the general circulating medium of trade, we raise the standard of the metallic industries, and recognizing the high claims of gold as representing civilization in commerce, we accord to iron its position as the great civilizer of the economic industries. The poetry of the by-gone may be sung, the hopes of the future cherished in vain, if honesty and industry does not sustain the present.

A FAVORED NATION.

This nation has been especially favored during the past century. Its commerce, its industries, and its natural resources have developed in an unparalleled degree. It has, in that period of time, planted liberty and civilization over more country than it ever existed in before; it has produced men and women peers of any man or woman of the time; its genius, its invention, its literature, its learning, are in sympathy with, and often in advance of sister nations. It has done more to balance the minds of men and destroy the fetters of women than all time has done before, and, while we do not forget the evil among us, let us rejoice that so large a share of good has come from the seeds planted by our forefathers, and determine in this, our nation's centennary of years, to emulate their examples of simplicity, of honesty, of industry and true patriotism.

The next feature on the programme was the singing of the "Marseillaise," by the Aimée Opera-Bouffe Company. The solos were sung by M'lle Aimée and Messrs. Raoult and Reine, and the chorus by the other members of the company. Aimée was dressed in costume, and carried in her hand the tri-color, and the whole was given with splendid effect.

The Poem was then read by Hon. Frank Soulé, its author, as follows:

THE ARTISAN.

Amid this life, so full of pleasant things,
  How few the number who have ever thought,
Whose apt and cunning hand it is that brings
  So many beauties from rough nature wrought;
So many comforts whence true pleasure springs;
  Who each invention to perfection brought,
Transforming Nature's wild and rugged dress
To forms of beauty, wealth and loveliness.

Behold! around, above you, sprung and spread,
  These walls, yon arch, each beam and architrave,
This dome that hangs suspended overhead,
  The symmetry the cunning builder gave—
Spun from the brain to such perfection led;
  And roof, and wall, and arch, and hollow nave,
Give answer: so be proud of your grand trade—
"This temple the MECHANICS' hands have made."

Who reared the shrine where Christians meet for prayer,
  And formed its pinnacles that tempt the sky?
Who hung St. Peter's dome as if on air
  It rested, a vast arch athwart the sky?
Who built the Pyramids and temples where
  The wondrous ruins of old Memphis lie;
Or Thebes, whose palaces and columns pile
With crumbling slabs the borders of the Nile?

His varied guilds are ancient as the time
When new life and inherent beauty told
What taste required when Eden in its prime
Surrounded man with glories manifold.
Inventive genius, pristine and sublime,
As broad as Nature, as creation old,
From the first garments made in Eden blooms
Down through the ages to the busy looms

Where Lyons weaves from shrouds the worm hath spun
The silken tissues beauty loves to wear;
The skill that with necessity begun—
Necessity continues everywhere—
Finds fit expression where'er threads are spun,
Or gliding shuttles move in dances there—
The work of busy hand and brain is seen—
'T is the Mechanic speaks through the machine.

He speaks from the relics of the Past;
Each shaft and temple that in ruin lies
He planted and fashioned; time and legions vast
Came and destroyed; beneath the broad, blue skies
He thought and toiled; and from the earth, at last,
Tower, shaft and pinnacle began to rise,
Stretched upward, calling through the middle air
The world of faith to thought, and praise and prayer.

Behold yon ship! who laid her plunging keel,
And placed and clad her timbers firm and strong;
On knee, and beam, and plank, the workman's seal
Of skill and labor placed; and traced along
Her model, lines of beauty; guiding wheel,
And mast, and spar and ropes, a countless throng;
Wove, made and bent her sails that hence shall be
The pinions wafting her across the sea?

Upon the ocean thus, as on the land,
This artisan leaves fixed his hands' impress;
He built the ships of the Armada grand,
And moulds our modern iron-clads no less;
Our swift propellers his clear genius planned,
The waters, as the land, his powers confess;
He builds and sends his Avitors to sail,
Buoyed on the air, to buffet with the gale.

Throughout the world and through the lapse of time
He has been moving, and improving all
From first ideas up to the sublime;
His brain and hand have answered to the call
Of Progress; whereso'er might genius climb
And grand invention at its bidding fall,
Minerva-like, from its creative brain,
He hath not toiled, nor thought, nor wrought in vain.

Look all around, let busy fancy wing
  Throughout earth's circle; call in memory's aid,
And ask what comfort life to us would bring
  But for the pleasant things his art essayed?
Your taper finger, lady, wears the ring
  His own, grown rough with honest toil, hath made;
'T was the mechanic formed for you the chair;
His fingers made the "number two's" you wear.

When fields are yellow with the golden grain,
  Whose heads bend down like pilgrims bowed in prayer,
And crops are ripe for harvest, hill and plain
  Tossed into mimic billows by the air—
Comes not the sickle, nor the scythe again—
  The patent reaper's mighty power is there;
And Ceres smiles upon the skill of man,
The plodding, keen, inventive Artisan.

I tire; too numerous the guerdons he
  Hath given the world for me to cite or sing;
Of benefactors first in rank should be
  His place and fame; 'tis not the rich who bring
Their costly, purchased luxuries, that we
  Should highest prize; give me the simplest thing
My dear friend's hand hath made; let him who will
Choose some bought *bijou* of a stranger's skill.

Let lawyers plead; let pious parsons pray,
  And doctors physic those who trust their skill;
Let merchants buy and sell, and bankers lay
  Their wits together how their vaults to fill;
And do them all due honor; but the bay
  And laurel worthiest should crown him still
Who fills our lives with comfort, planned and wrought
By skillful hands and long and patient thought.

And so farewell, my unexhausted theme;
  I scarce beyond its vestibule have trod;
Within I see the Architect's grand scheme
  That stretches from earth's workers up to God,
The spark that leaves the steel the solar beam,
  The rolling planet, and the lowly clod
Bide the same laws; who follows best their plan
In labor, is the greatest Artisan.

The High School girls then sang another beautiful song, after which Mr. Henry Edwards, Orator, was introduced and delivered the oration, choosing for his theme

"IRON AND ITS RELATION TO CIVILIZATION."

Mr. President, Ladies and Gentlemen: There is a time in the life of every man when embarrassing circumstances seem to surround and overwhelm him, and if that time never reached me before, it would appear to have come upon me now. The kindly manner, however, in which the request of the Directors

that I should make this address was conveyed to me, left me no resource but to accede to their wish, and do the best I could to fill the position which their too generous estimate of my abilities has forced upon me to-day. During some days of anxiety, when the subject on which I should speak to you chiefly occupied my thoughts, one of the warmest friends of this institution, a gentleman known and highly regarded by all, suggested to me that I should take as my theme "Iron and its Relation to Civilization." The idea, for which I here publicly thank my friend, at once seized upon my mind, and I resolved to follow his advice, begging you to thank him more than myself for what you may hear to-day. The field of thought covered by this suggestion is a mighty one, far too vast for the contemplation of an hour, and only on the present occasion to be regarded as the opening of the volume, leaving the wealth of its pages untouched and unexplored. It is one of the contradictions of our imperfect nature that those objects which are always present with us, and which become, as it were, a part of our every-day existence, receive too little consideration at our hands. We take them as our right, and, utterly unconscious of that spirit of gratitude which should fill our souls at the knowledge of the countless blessings which are ours unsought, we pause not to consider whence they come, how important they may be to our daily wants, or how great the loss we should sustain by their withdrawal from our possession. And iron is one of these—iron, that common metal with which we are all so familiar, with the use of which, in some form or other, we hourly come in contact, of whose chemical constituents we now know much, whose formation and geologic conditions have been made clear by the light of modern science, but whose discovery by man, and his first application of the metal to the uses of his life are all but a sealed book to us, the smallest streaks of light alone breaking in upon us to relieve the darkness of our search. Far off in that remote period in which history is utterly lost, and even tradition becomes merged in the gloom of obscurity, we may imagine some dusky savage starting with delight and wonder as he views the sparkling crystals of the heavy lump of stone beneath his feet, of the composition of which he knew nothing, but which in after ages was destined to be the greatest "boon to mortals given," the grand handmaid of progressive civilization, and the all but indestructible basis of the noblest works which ever emanated from the genius of mankind.

THE PRE-HISTORIC IRON SMELTER—A PROGRESSIVE CHANGE.

How the first crude worker in iron conceived the idea of reducing that coarse, heavy mass into a malleable form, rendering it plastic and obedient to the skill of his hands, we know not. Here the curtain falls upon our ken, and imagination, unaided by positive knowledge, can alone assist us. Owing, however, to the difficulty which exists in reducing it from its ores, its extreme hardness and want of discrimination as to which variety of ore would be the most productive, it would appear that iron was by no means the first metal whose use was learned by our progenitors, doubtless yielding, in this respect,

to lead, silver and copper. But still in this statement we are wandering into the realms of speculation. The condition of man in his earliest ages of existence was probably as different in all its general characters as our own may be from that of the inhabitants of Jupiter or Saturn, and the only certainty we can lean upon is that the metal once found, its uses gradually became known, the first purposes to which it was applied being most probably the fabrication of weapons of the chase or of war. These far-off times are shrouded in mystery, but as we stand awhile upon the mountain of thought, far removed from the petty vexations of life, and contemplate the stir which everywhere around us has proceeded with the most ceaseless activity, we see written as the eternal law of Providence a progressive change from a lower to a higher form of existence, and recognize in every department of our being examples of this progress working ever upward and onward to a grand purpose—a purpose yet unfulfilled, but expanding day by day and hour by hour, nearer and ever nearer to that perfection which, though never absolutely reached, is, in the very nature of things, one day compelled to burst into the open sky of peace, of freedom, and of love. And so, as the geologist by the aid of physical facts can trace the growth of worlds, and assign to each created thing his place and period in the past scale of creation from the azoic age, devoid, as the name implies, of the smallest trace of life, up to that marvelous epoch when the earth echoed with the tread of man—so can we understand how that mighty being

"By slow degrees, by more and more"

improved in growth and culture, and gave evidences, even in those barbaric days, of a civilization yet to be, a civilization yet unseen, but as perfect and as certain as is the form of the flower within the unopened beauty of the bud. And as he grew stronger and stronger, gaining hourly in intelligence, and in each century of his existence removing himself further and further from the brute condition of his primal form, fulfilling that eternal law of outgrowth which shines with untiring brilliancy upon all the handiworks of God, his wants necessarily became more and more numerous—the products of earth were searched and tested to satisfy their desires, and every object which could aid those wants, was greedily seized and forced into the army of their supply. Among these iron undoubtedly held a foremost place, and, though we can assign no positive period as the date of its first manufacture, the researches of Sir John Lubbock and others mark its existence among the lacustrine dwellings of Switzerland, away back in those prehistoric times when man had no records, and has left no trace of his existence beyond the buried relics of his primitive homes.

EARLIEST WRITTEN RECORDS OF IRON.

While descending the stream of more approximate history we find that Homer, who is supposed to have lived in the ninth century before Christ, is accredited in Pope's translation of the *Illiad* and the *Odessey*, with many allusions to this metal. In the latter poem Minerva, under the guise of "Mentor,

monarch of the Paphian land," while explaining to Telemachus the reason of her visit to Ithaca, says:

> "Freighted with iron from my native land
> I steer my voyage to the Brutian strand
> To gain by commerce, from the labored mass,
> A just proportion of refulgent brass."

These facts would tend to show a greater antiquity for the use of iron than has usually been assigned to it, and some explorations made of late years in the great pyramid of Cheops, have brought to light wedges of iron, firmly imbedded in the crevices of the enormous blocks of which these structures are composed, which could not have been manufactured according to the best Egyptian scholars subsequent to 3,000 B.C., while in the buried cities of Asia and America iron implements of various kinds and ornamental designs in the same metal have been frequently discovered. But it is from that grand storehouse of knowledge which, however degenerated to-day, has been the birthplace of many of our most treasured discoveries, from the "rich Orient, studded with her gems" that the first historical records of the uses of iron came to us, carrying us down the mighty river of time to the more familiar period of the Greek and Roman dynasties, and it is from about 300 years previous to the Christian Era that our really reliable information comes, the Romans, then the masters of the world, being probably the first to perceive the malleable properties of the metal, and to apply it to many uses before unknown.

THE ROMANS AS WORKERS OF IRON.

It is certain that the rich mines of the Island of Elba were worked by them upwards of two thousand five hundred years ago; while we learn from the Commentaries of Cæsar, that, on his invasion of Britain, the spears and lances of the inhabitants of that island were either wholly made or tipped with iron; and during the occupation of Britain by Julius and his successors, the rich mines of the Forest of Dean, in Glocestershire, were constantly worked by the Romans—numberless cinder-heaps in that grand old domain still remaining to mark the rude efforts of the conquerors to extract the coveted metal from its rebellious ore. Over many of these cinder-heaps, now covered with rich soil, the product of disintegration and decomposition in the past centuries, I have wandered as a boy, and gathered lovely flowers, which grew up in the crevices of these singular remains—the cinder-heaps of Dean Forest being spots well known by every naturalist who has visited that region; in winter producing many rare and curious fungi, and in summer equally rare flowering plants, which in their turn were visited by insects elsewhere but seldom seen. The furnaces used by these people in smelting the ore are, in many cases, still in existence, being always erected on the top of some eminence, so as to obtain the greatest force of the wind. Charcoal was used for the fires, and it is not difficult in some places to trace the remains of charcoal-pits, nay, even of the very trees cut down for the purpose of being converted into fuel. "The processes of extracting the iron

were, however, naturally very rude and imperfect, and left so much iron in the cinders, that several of the heaps in the Forest of Dean furnished the chief supply of ore to twenty furnaces for upward of two hundred years." From the time of the Romans the workmanship in iron gradually improved, and its use spread over Europe and Asia, large deposits being discovered in Sweden, Russia, Siberia, Persia, Italy, France, and England. The last named country now produces the bulk of this metal—one bed in the north-east of Yorkshire yielding for several years no less than the enormous amount of 400,000 tons per annum; while some mines in the County of Cumberland gave, in 1861, the almost incredible result of one million tons.

IRON PRODUCTION IN AMERICA.

Next to England in point of production stands the United States; and though very much of what is used is still imported from Europe, there is good reason to hope that, in a few years, by increased facilities, and by the exercise of enterprise and capital, the iron mines of North America will take the lead of all the world, and in their turn supply much of the demand from the older countries across the Atlantic. The early settlers of this country, though soon becoming acquainted with the existence of metalliferous deposits, could not make them a special object of their search, as the beds of ore with which they were enabled to become acquainted were, for the most part, far removed in those days from their settlements, and were known chiefly to the Indians, who manifested a hostile feeling to the invaders of their soil.

EARLY HISTORY OF AMERICAN IRON-SMELTING.—ITS RELATION TO THE DECLARATION OF INDEPENDENCE.

It was not until the year 1702 that a furnace for the purpose of smelting iron was erected in Plymouth County, Massachusetts, being followed, a few years later, by other such enterprises in Rhode Island and Maryland. The pig-iron thus produced was chiefly exported to Great Britain, where it was admitted free of duty, manufactured articles of iron and steel being returned in its stead. In 1771, the shipment of iron from this country to Great Britain amounted to 7,525 tons; the exportation ceasing with the war of independence, one hundred years ago. I am not here to-day to speak to you of your marvelous advances in every department of economy which tends to the permanence of your social progress, since that eventful period of American history in which an oppressed people rose to vindicate their rights and to trample beneath their liberated feet the shackles which had so long bound them; but I may respectfully, as an Englishman, ask you, natives of this vast and ever advancing country, to believe that, in common with myself, there are thousands in your mother-land to-day who hail your "Declaration of Independence" as the dawn of a new era of freedom, not for yourselves alone, but for all who have felt the heel of the tyrant, and who crown your glorious work in this Centennial year with the thanksgiving and the blessing

which ever spring from the depths of warm and sympathizing souls. And it is good to remark in this connection, that that very Declaration had in view in one of its clauses the grievances which the early settlers experienced in the harsh measures adopted by Great Britain to prohibit the erection of furnaces for the smelting of metals—the mother-country having passed an Act denouncing all such erections as "nuisances," fearing that the growth of such manufactories would tend to lessen her hold upon her transatlantic territory. But, happily, this overbearing tyranny is at an end forever, and, by a tremendous bound, rather than by gradual growth, the Union has become the second in importance as an iron-producing country, and this in the short space of a single century. I find it stated in *Gray's Physical Atlas*, that, "after the close of the war, the chief supplies were again furnished by Great Britain, from the lack in the United States of the capital necessary for the successful prosecution of the business. The natural advantages possessed by Great Britain powerfully coöperated with her legislation; and as her rich deposits of iron and coal were in close juxtaposition, and in localities not far removed from the coast, the iron interest became so fully established that no nation accessible to her ships could successfully engage in the same pursuit, until, by following her example, its own mines and resources could be fully developed." In 1810, the amount of pig-iron produced in the United States was 54,000 tons; in 1828, this had increased to 130,000 tons; in 1842, to 240,000 tons; and in 1870, to the enormous result of 2,052,881 tons—this vast quantity being the product of 3,210,918 tons of iron ore. It may be well for me to add, that fully one-half of this was mined in the State of Pennsylvania alone, though large deposits of ore exist in Ohio, New York, Missouri, and Michigan; in fact, there are no States in the Union, with the exception of Florida, Texas, and Louisiana, which do not contribute their quota to this priceless branch of industry.

PRESENT PRODUCTION OF THE COUNTRY.

Year by year the yield of iron in the United States, as well as in Europe, is constantly increasing, and from the most reliable statistics at my command, the total product of the year 1874 amounted in round numbers to about 9,000,000 tons, the value of which, taking the average price of pig iron at that time, was not less than $200,000,000. The mind almost staggers under these tremendous figures, and did we not know how universal was the use of this metal, we should hesitate to accept such statements. But the purposes to which it is applied in our social economy are all but infinite, and as civilization advances with her giant strides, "iron, more iron" is the cry forever upon her lips, as the grandest need of her progressive path. It is away from my present purpose to talk to you of the chemical composition of iron. I would not if I could, and I could not if I would, but it may be well for me to state that iron is never in a state of nature found absolutely pure, but exists in combination with other substances, forming oxides, carbonates, phosphates, silicates and iodides of iron, which are again subdivided into various specific metallic forms and compounds. Probably the richest of all known

ores, containing I believe nearly 73 per cent. of pure iron, is that technically known as the black oxide, a variety for which Sweden is especially famous, the metal produced from it being generally esteemed the best in Europe. The mines of Dannemora, in Sweden, have been constantly worked since the 15th century, while large deposits of this variety (known also as magnetic iron) are found in the Ural mountains of Russia, and in this country, in Canada, New Jersey, Pennsylvania and Virginia. "The rock formations in which magnetic iron ore occurs contains no coal, hence it is almost always smelted with wood-charcoal, which, as it contains no sulphur, is one great cause of the superiority of the iron produced from it." With regard to the process of smelting, I find, on the authority of *Chambers' Cyclopedia*, that "charcoal was constantly used for this purpose up to 1618, when Lord Dudley introduced the use of coal, but the iron-masters being unanimously opposed to the change, Dudley's improvement died with him, and was not re-introduced until 1713, when Abraham Derby employed it in his furnaces at Coalbrook Dale. About 1750 the introduction of coke gave renewed vigor to the iron trade, and then followed in rapid succession those improvements in its manufacture which give to the history of iron all the interest of a romance. The steam engine of Watts, the process of puddling and rolling invented by Henry Cort in 1784, the employment of the hot blast by Neilson of Glasgow, in 1830, and the well known Bessemer process of later days, were grand discoveries in this branch of industry, and worthy pioneers of the more extended knowledge of the reduction and utilization of the metal which year by year is made to dawn upon the horizon of mechanical science.

VALUE OF IRON—ITS MULTIFARIOUS USES.

Indeed the energy and intelligence bestowed upon the subject of iron throughout the world, are in themselves sufficient to prove its extreme importance to the race, did not its multifarious uses come hourly beneath our notice, and testify to its existence as a necessity of our being. Who can overvalue its worth? Who can attempt to sum up the comforts we derive, the blessings we enjoy from a knowledge of its uses and its power? The miles on miles of railways which stretch themselves like a net-work over the surface of our planet, binding continents together in a bond of fellowship, and linking distant nations hand to hand, would have no existence but for iron. The pumps which draw the sparkling water for us from the depths of the earth; the pipes which convey it from distant reservoirs for our cities' use; the fleet of white-winged ships which stud our seas like messengers of love, carrying blessings from one land to another, exchanging the fruits of the earth and cementing the whole world in one compact and universal brotherhood; the grand and complicated machines which fill your courts to-day, and attract the attention and move the wonder of mechanical minds; the lofty structures which rise around us on every hand, sublimely reaching up to Heaven, as if in meek but earnest praise to the grand creative mind whence all has sprung—attest in trumpet tones the precious boon which iron has been to man, the most important want and

blessing of his race. Turn where we will its worth is seen; examine where we may its power and its uses are experienced and known. There is no position in life, no rank in society which is independent of its assistance. Not only in those mighty works, which assert man's claim to the gratitude of coming ages, but in the minor details of our daily life, in all the countless relations which go to make up the sum and comfort of our being, the value of this marvelous product is enforced upon our attention. The surgeon's instruments, and the bridge which spans a cataract, the dainty needle, and the hammer which can crush a ton, the scythe of the mower, and the lever which can stir a palace, the fearful war guns before whose fire whole armies sink as puppets, and the wire which cages the imprisoned bird, the lighthouses which protect our coasts, throwing their beacon lights far across the deep as the wanderer's warning and his sign, and the pen which writes our messages of love, the delicate mechanism which guides the movements of our watch, and the stupendous columns which lift themselves far up into the eternal and bare their brows to God—these are but a few of the varied purposes to which it is applied, and for which it claims our recognition and regard! And let us ever remember, that for it no substitute can be offered—no metal known to us can take the place of iron in its controlling and multifarious uses. For gold, silver, copper, lead, or tin, something may be found to supply the place; for iron, nothing!

THE WORLD WITHOUT IRON.

It is terrible to contemplate the utter blank which the world would become, if it were possible that, by some sudden convulsion, it could be withdrawn from us, and banished from the earth. As if by the touch of a magician's wand, a desolation, vast and awful, to which the most fearful earthquake that ever devastated the world would be but as the falling of a house of cards, the plaything of a child, would come upon us a desolation so stupendous and so crushing in its immensity as to suggest the day foretold by the prophet—"a day of darkness and of gloominess, a day of clouds and of thick darkness"—a desolation which would send our planet, with its 1,300,000,000 of souls, drifting backwards and ever backwards to her primitive condition, the intelligence of her inhabitants fading with the lapse of the ages, and her surface becoming gradually unfitted for the abode of man. The mind can hardly realize the change—the paralysis of all endeavor, the destruction of the mighty aids to labor, the uprooting of all social and business institutions, and the total annihilation of commerce in all its forms, which would follow such a vast and overwhelming catastrophe! Our grandest edifices would crumble into dust, our noble ships would fade into shapeless masses and go down rotting to the sea's extremest depths; our telegraph would no longer waft its messages with lightning speed, putting its "girdle round about the earth;" our mighty engines, which now with almost a living voice proclaim themselves the emperors of force and power—which carry us with such rapidity from place to place, making the once unknown corners of the earth but pleasant visiting-spots for a summer tour—would pass forever from our

sight; our printing press would cease its holy labor; our fields would become choked with weeds, and the furrows of the plow be known no more! The civilization of which we now so worthily boast would have run its course—would lapse into the barbarism out of which it sprung, and,

"Like an unsubstantial pageant faded,
Leave not a rack behind."

This may be a melancholy picture, but it by no means exaggerates the endless evils we should suffer, could the iron of the earth be at once eliminated from its products; and the contemplation of such an appalling wreck should at least help us to be grateful for so powerful an adjunct to our social wants.

THE FUTURE OF IRON.

And, looking down the vista of the coming years, do we not with our more interior vision see the possibility of a still wider application to the cravings of a succeeding race than any we have known? Does not the daily growth of the arts and sciences which occupy man's attention to-day, and the cultivation of which adds hourly to his refinement, and brings his nature nearer to the Divine—does not this suggest the existence of uses for this metal even greater than those we already know, uses as yet but dimly seen even by the speculative and far-seeing mind? Perhaps we are but yet upon the threshold of the temple, and the secrets beyond the vestibule may yet be hidden from our gaze. In the more refined arts of life—in engraving, in photography, in the polishing of various substances, in the cutting of glass, and in the structure of ornamental designs—our knowledge may be fairly said to be in its infancy. And, turning from the peaceful and purifying arts of life to considerations of an opposite character, do we not with a thought perceive how of late years—at least within our present century—iron has been employed by man to meet one of the exigencies of his nature, in the construction of those vast and fearful implements of war which are one of the most striking features of our age? The iron-clad ships—which, in their present and more perfected form at least, had their origin in America, and which, to the number of nearly four hundred, with the aggregate equipment of over three thousand guns, are now employed by all the warlike nations of the globe—are due to the existence of iron. The perfect immunity of these vessels to the discharges of the cannon in vogue among our fathers suggested heavier artillery; and more powerful guns were needed, to penetrate the armor of this mighty fleet. Those of modern times have attained such sizes and such power, that we stand aghast at the marvelous amount of ingenuity and constructive genius which men have devoted to the destruction of each other, and wonder if that glorious period spoken of by Tennyson—

"When the war-drum throbbed no longer, and the battle-flags were furled,
In the Parliament of man, the Federation of the world"—

lives but in a poet's dream. The guns made by Krupp of Prussia, who was

one of the pioneers of this branch of industry, challenge our admiration, at the same time that they excite our awe. One of these stupendous weapons, made for the Russian Government in 1868, had a total weight of fifty tons; the diameter of the bore being fourteen inches, and the length of the barrel two hundred and ten inches. This gun would carry a shot weighing 1,212 pounds, the propulsion of which would require a charge of not less than one hundred and fifteen pounds of powder. The price of this gun, with its carriage and turn-table complete, amounted to $150,000 of our currency; the time occupied in construction being sixteen months of unremitting labor. How terrible the expenditure of all this skill and power for the one purpose of destruction! But, as in the physical world we see that earthquakes, hurricanes, and volcanoes subserve a useful purpose, and prepare the earth for the culture and the use of man, so is it held by many thinking and philanthropic minds that, with the improvement of our weapons of war, the era of peace will more speedily come—that era of which Elihu Burritt, the learned worker in iron, who was "transplanted from the anvil to the editor's chair by the genius of machinery," triumphantly says: "War shall die, and all things that love the face of man and the face of nature, that love to look up in the pure and peaceful sky, that commune with the silent harmonies of the great creation and listen to the music of reasoning things, all these shall fill the heavens with one grand '*Jubilate!*' that the great cannibal is dead" But, however this may be, certain is it that, through these mighty engines of destruction, the strife of nations will no longer be decided in close contact, upon the blood-stained deep or on the crowded battle-field. "The sword may indeed be turned into a plowshare and the spear into a pruning-hook," but the horrors of war will be rendered more short-lived, even if more devastating and more decisive, if apparently more cruel in their operation; and while we sorrow over the deadly feuds which agonize our race, let us remember that the destinies of nations are in wiser hands than ours, and that we in our impotence can but look on, wonder, and revere!

PACIFIC COAST CONSUMPTION AND DEPOSITS OF ORE.

I feel that I have already detained you too long, but I must, before I conclude, say a few words as to the existence upon our own coast of the metal we have had under consideration, and the probability of its one day becoming an object for the employment of capital. It may be already known to you that, in several portions of this State, deposits of iron ore exist, which need only increased enterprise to render them of immense value and importance. In Sierra Valley—near Marysville—and near Colfax, large beds of ironstone have been discovered; and when it is known that, according to a statement recently made in the *Mining and Scientific Press*, "the quantity of iron annually used upon this coast cannot be less than 60,000 tons, worth in the rough about $3,000,000, and in a manufactured state not less than $10,000,000," it must be allowed that the development of the iron resources of California and the neighboring States is at least worthy of consideration. In Oregon, some excellent mines, producing ore of the very finest quality, have long

been profitably worked; and in British Columbia, a whole island in the Gulf of Georgia, known as Texada Island, waits but the energy of a few determined men to give to the world iron ore sufficient to keep employed hundreds of laborers for many decades to come. The city of San Francisco alone has within its limits no less than forty-seven iron foundries, machine shops, and boiler factories, employing upwards of 3,000 hands, expending annually for wages not less than $1,000,000; and yet it is safe to say that not more than 2,000 tons of the iron used by these establishments is the product of our own region. It would appear that there is something wrong here, when we consider that the deposit on Texada Island, to which I have just alluded, contains on a rough estimate nearly 12,000,000 tons of ore, and that the cry of dear coal and scarcity of wood for the purpose of making charcoal, which may have some weight in California, cannot prevail here; abundance of both coal and wood being close at hand for the purpose of smelting, while nature affords every facility for shipping the result of the enterprise, and carrying it to its market in other lands. And surely it cannot be deemed Utopian to believe that the day is not far distant, when this production of a metal in so general demand, all over the world, will become one of the most attractive industries of our coast, and that we may supply our numerous foundries with the basis of their labor, mined and smelted within the limits of our own boundary. At the close of the first century of her independent existence, America has no reason to be abashed at her condition among nations; and when we think that California has hardly completed her first quarter of the same period, we may well be proud of the progress which she displays to-day. States, like children, must have time to grow, and, expanding into maturity, to shake off the weaknesses of their early growth; and if we are now passing through a stage of fast life, too eager for the sudden acquisition of wealth, and neglectful of opportunities which lie within reach of our hands, the day is not far distant in which we shall cast off the too feverish excitement which surrounds us now, and with more sober judgment, and experience, none the less valuable because purchased in the market of failure, direct our energies and our power to the grandest foundations on which the prosperity of a country can be based—the enlightened cultivation of her soil, and the industrious and intelligent development of her mineral treasures.

After the singing of a final Grand Chorus, the large scenes at the rear of the stage were withdrawn, disclosing a magnificent tableau of about sixty characters, at work, representing the different trades. In the front was placed a handsome young lady, at work on the old-fashioned spinning-wheel, and behind her about fifty different workingmen at their work, including the carpenter, barber, boiler-maker, brick-layer, upholsterer, shoemaker, compositor, knife-grinder, weaver, and a number of others. The groupings were made by Mr. Vincent, and the effect was beautiful. The audience demanded the raising of the curtain, which was done, and the view repeated, each time receiving a hearty encore. The immense pavilion on Market, Eighth, and Mission streets was thrown open to the public at seven o'clock the same evening.

CLASSIFIED LIST OF EXHIBITORS.

[EXCEPT THOSE GIVEN IN ART GALLERY CATALOGUE.]

Section.	
1	Ætna Foundry.
1	Agnew, J. J.
3	Alexander, Lyman
9	Alexander, Mrs.
9	Alexander, Miss R. E.
8	Alden Fruit Preserving Co.
5	Alta Soap Co.
6	Altman, F.
1	Allison, C.
6	Ames, H. K.
3	Angora Robe and Glove Co.
4	Armes & Dallam.
3	Ash, Mrs. I.
3	Astoria Fishery Co., Oregon.
4	Atkinson, G. F.
4	Badger, W. G.
3	Bailey & Co., Thos.
2	Baker, Miss A. W.
5	Balcear, Madam
9	Ballou, A. L.
3	Balny, A. J.
4, 9	Bancroft, A. L. & Co.
2	Bartlett, Mrs. Earl
2	Baxter, Mrs. Chas. E. A.
3	Beamish, P. & Co.
1	Beauman, L. W.
3	Beauman, Miss
5	Beebee, Dr. W. S.
3	Behrendt, H. & Co.
3	Bell, Gullixson & Co.
1	Beman, William
4	Benjamin, E. M.
5	Benjamin, H. A.
1	Bergeman & Bros.
4	Bergstrom, John

Section.	
2	Bernard, William
6	Berringer & Co.
2	Bettelheim, Dr. A. J.
1	Bidwell, J. C.
4	Biggers, J. A.
4	Black, H. M. & Co.
5	Blake, Dr. Chas. E., Sen.
1	Bluxome, J. & Co.
4	Boerner, C.
1	Boesch, Emil
9	Bones, J. W.
9	Borman, Mrs.
5, 8	Bowen Bros.
5	Bradford, H. A.
9	Bradley & Rulofson.
4	Brady, M. T.
4	Brehm, R. W.
1	Bromley, George T.
2	Broom, J. M.
1	Browell, J.
4	Brown, B. C.
9	Brown, D.
2	Brown, Mrs. E. J.
9	Browne, Carl
1	Bryan, J. M.
1	Bucknam, E. T.
9	Bugbee & Son, S. C.
4	Bulte, Peter
9	Burgen, A. J.
5	Burns, Peter
2	Burton, W. H.
1	Bushell, ——
3	Butler, C. T., Mrs.
9	Buttleman, Mrs.
2	California Beet Sugar Co.

Section.	
4	California Bellows Mfg. Co.
4	California Brush Co.
6	California Electric Power Co.
5	California Fertilizing Co.
4	California Furniture Co.
2	California Rock Candy Co.
3	California Silk Mfg Co.
2	Campbell, J. H.
5	Campbell, W. H.
2	Cantell, Mrs. H.
2	Carrigan, Mrs. Mary
4	Carvill Manufacturing Co.
7	Chenery, Souther & Co.
8	Cheney, Jesse
4	Childs, N. B.
2	Chillson, L. D.
3	Clarke, Miss Annette
1	Clark, Fred.
9	Clark, Miss Jennie E.
4	Clark, T. S.
4	Clark, Rickoff & Co.
2	Cleveland, A.
5	Cochrane & Richmond, Drs.
4	Coe, O. R.
2	Cole, Mrs.
3	Coleman, W. T. & Co.
1	Collins, Benjamin
9	Commary, Mrs.
9	Conklin & Co.
2	Conrad & Co.
3	Cook, H. N.
4	Coombs & Taylor
5	Coon, N. S.
2	Corbett, H.
2	Corbitt & Mackley
9	Cosksy, Mrs. J. A.
4	Cosgro, James F.
6	Craven, H. S.
2	Crawford, A. & Co.
4	Crego & Bowley
9	Crocker & Co.
8	Crofton, John
6	Cushing, Volney
6	Cutler, E. B.
3	Cutting & Co.
9	Dahle, Miss Annie

Section.	
1	Dalton, H. M. & Co.
4	Dampf, Louis
1	Daniels, John
3	Davison, Mrs.
1	Day, Thomas
2	Deaf, Dumb and Blind Asylum, Oakland.
2	Dean, S. H.
9	Deaves, Charles W.
1	Dennison, E. G.
9	Dewey & Co.
5	Dickey, Geo. S.
8	Dietzler, General
6	Domestic S M. Co.
6	Donner & Suhl
2	Douglass, Capt. W. J.
9	Dow, D. S.
4	Duffy, Timothy
1	Dunham, Carrigan & Co.
9	Dunlop, Miss M.
6	Dunn, Michael
4	Dutripon, Pierre
4	Duvall & Sanborn
9	Dyer, W. D.
9	Eastman, Mrs. Emily R.
4	Eaton, Charles S.
2	Ebright, Mrs. H.
9	Ellis, Mrs.
6	Elsasser, Charles
3	Eppler, Miss R.
1	Eskins, J. S.
4	Eureka Broom Factory
1	Eureka Stone Mfg. Co.
6	Enterprise Manufacturing Co. of Pennsylvania.
1	Fenn, F. C. M.
4	Figer Brothers
9	Ferman, John L. E.
6	Fish, A. L. & Co.
1	Fisher, E. E.
5	Fishbeck & Co., H.
3	Fitzpatrick, Davis & Co.
2	Flint, Peabody & Co.
6	Fonda, W. T.
9	Flood, Mrs. C. A.
2	Follingsby, T. H.

Section.	
3	Forsman, Mrs N. F.
3	Foster, S. & Co.
6	Frank Brothers & Co.
4	Freeman, B. H. & Co.
9	French, Mrs. Dr.
3	Freud, M. & Son.
4	Friedhoffer, Paul
2	Friedlander, Isaac
6	Fry, W. B.
4	Fulda Brothers & Co.
4	Gallagher, B.
1, 6	Garratt, W. T.
2	Garton, Mrs. Elizabeth
1	Gates, E.
1	Gates, James H.
5	Gates, J. R. & Co.
5	Giant Powder Co.
4	Gilbert & Moore
9	Gillin, Mrs. M.
9	Gilmore, John H.
1	Gladding, McBean & Co.
9	Golden Gate Academy
1	Golden Gate White Lead and Color Co.
6	Gooding, William
4	Goodwin & Co.
1	Gordon, James E.
4, 5	Gosling, H.
1	Grant & Co.,
9	Grant, George W.
4	Gray, J. & Co.
4	Gray, S.
3	Gray, Samuel C.
1	Gray & Winslow
6	Gregory, H. P.
6	Griffin, M. G.
6	Guerin, Mons.
6	Gutzkow, F.
1	Hakes & Carroll
4	Hall, C. R.
5	Hall & Wagner
4	Halkett, N.
1, 6	Hallidie, A. S.
1	Halsey, W. G. & Co.
1	Hanscom, W. W.
4	Hanzsche, T. G.

Section.	
2	Harrison, Mrs. B. F.
2	Hartshorn & McPhun
3	Haustorf, M.
6	Hawkins & Cantrell
6	Hawley, M. C. & Co.
8	Hayes, Daniel E.
1	Hayes & Co., George
9	Heald's Business College
2	Healy, Col. Jesse
9	Healy, Mrs.
4	Hendrickson, J.
6	Hendy, Joshua
5	Henley, Dr.
2	Heyman, Mrs. H.
3	Hermann, Theo. & Co.
4	Heywood Bros.
6	Hill, Samuel
5	Hill & Beebee
6	Hinckley & Co.
9	Hodge, J. G. & Co.
4	Holcomb Bros & Co.
1	Holbrook, Merrill & Co.
4	Hoey & Taylor
9	Hollis, Wm.
6	Holloway, J. E.
4	Hook, E.
9	Hossack, A,
1	Howard & Morse
4	Howes, E. K. & Co.
4	Hubbard, E. A. Co.
5	Hueter Bros. & Co.
6	Hunt, E. O.
6	Huntington, F. A.
6	Huntington, Hopkins & Co.
3	Hutchins & Co.
5	Hutchinson, D. S.
4	Hyde, Walter
9	Ireland, Mrs. W., Jr.
3	Jackson, R. W.
6	James, D. B.
1	Jennings, J. T.
2	Johnson, J. C. & Co.
9	Jones, Annette, Miss
9	Jones, Edward E.
3	Joseph Bros.
6	Keeler, J. M. & Co.

Section.	
2	Kelloch, Mrs. S.
3	Kelly, P.
4	Kelly & Dalton
6	Kendall, Stephen
3	Kendall, Mrs. M. V.
1	Kessler, J. & F.
3	Kickens, Mrs. M. R.
8	King, C. J. of Wm.
4	King, T. H. & Co.
1	Kittredge, Jonathan
3	Knewing, F.
1	Koehler & Ritter
7	Kohler & Frohling
2	Kosminsky, H., Mrs.
9	Kruger, August
7	Lachman & Jacobi
8	Lake, H. & Co.
2	Lamorine, Mme. C. K.
3	Lancaster & Northon.
7	Landsberger, I. & Co.
7	Lang & Co.
9	Langrehr, H. C.
4	Larkins & Co.
4	Larsen, C. J.
4	Lawrence, J. L.
9	Lawton, Lena Miss
9	Lentall, Mrs. E.
4	Leonard, C.
1	Lerake, Anson S.
5	Levy, Edward
5	Liesenfeld, P.
6	Linforth, Kellogg & Co.
3	Littlefield, Webb & Co.
1	Locke & Montague
9	Loomis, Rev. Dr.
3	Lorquin, E. F.
7	Lachman & Jacobi
3	Low, C. Adolphe & Co.
1	Low & Chartrey
4	Loryea, Dr. A. M.
9	Lucas, Mme. Anna Gettz
9	Lyon & Co.
3	Mackey, Alexander
7	Mahé, Gustave
3	Main & Winchester
5	Mallon, John
9	Mangenberg, Mrs. Alwina
9	Marden, R. A.
9	Marriott, Fred.
1	Marwedel, C. F.
1	Marwedel, E. H.
6	Mattick, N.
3	Maxfield, Mrs. H. B.
1	McAffee, Spiers & Co.
6	McCormick & Co.
4	McCue, M.
3	McGrath, Mrs. M.
3	McGrill, Miss M.
4	McIntyre, George
1	McKibben, Thomas
4	Meeker, James & Co.
2	Merchants' Exchange
3	Mermaid Salt Water Bathing Company
1	Merrell, I. L.
2	Merrett, Mrs. P. V.
9	Mezzara, P.
9	Mihills, L. K.
3	Moody & Farrish
4	Moore, Dr.
5	Moore, Mrs. H. A.
2	Moore, Mrs.
9	Morrow, Mme.
4	Moses, W. S.
5	Mourgeana, Mme.
3	Murray, Mrs. J. P.
9	Muybridge, E. J.
1	Myers, L. B. & Co.
4	Nachman, A.
9	Nahl, Arthur
1	Nathan, B. & Co.
6	Nelson, W. C.
1	Nelson & Doble
2	Nevins, Mrs. J. H.
5	Newman, Carlton
9	Newman, Edward
1, 5	Newman & Bennett
5	Nicholson, S. H.
6	Norton, G. A.
2, 9	Nye, Mrs. Albert G.
2	Nye, Albert G.
6	Ogden, F.

Section.	
5	O'Neil, Thomas
1	Oregon Iron Co.
6	Osborne, D. M. & Co.
1, 6	Osborne & Alexander
1	Otto, Charles
1	Owens, J. B.
1	Pacific Gold and Silver Plating Works
1	Pacific Jewelry Co.
1	Pacific Lamp and Reflector Co.
2	Pacific Oil and Lead Works
6	Pacific Railway and Car Co.
6	Pacific Rubber and Paint Co.
1	Pacific Saw Co.
6	Padden, William
1	Painter & Co.
6	Palmer, Knox & Co.
1	Palmer, W. F.
1	Paltenghi, A.
3	Pardini & Debant
1	Paul, P. D.
4	Paulson, P.
6	Pendleton, B. F.
2	Perkins, D. L.
6	Perkinson, J. E.
4	Peters, C. T.
4	Peters, J. M. L.
4	Phelps, Walter
3	Phœnix Oil Works
4	Pilbeam & Henderson
6	Pinkham, J. C.
2	Pioneer Paper Mills
4	Plum, C. M. & Co.
3	Poheim & Lancaster
4	Pollard, Benjamin
1	Portland Concrete Sewer Pipe Company
5	Potrero Compressed Yeast Co.
1	Potter, G. A.
6	Potter & Bailey
6	Prescott, Scott & Co.
6	Price Press Co.
6	Prismoidal Railway Co.
3	Pritz, Mrs. Eliza
1	Quick, J. W.
9	Quimby, W. C.
9	Ralph, Mrs. L. A.

Section.	
1, 6	Ransome, Ernest
1	Raymond, G. A.
9	Real Estate Associates
2	Redden, Miss Jessie
5	Redington & Co.
1	Red Mountain Copper Co.
2	Reed, Robert
9	Regel & Wells
9	Regensberger, Mrs. F. S.
1	Reinhardt & Isaacs
5, 7	Renz, Dr.
1	Rhodes & Wason
9	Rich, Mrs. D. W.
1	Roach, John
6	Robb, Herbert C.
9	Robertson, J. D.
9	Robertson, Mrs. John W.
3	Robinson, Juan A.
1	Rochicioli, R. F.
3	Rodgers, Meyer & Co.
4, 9	Roman, A. & Co.
2	Rowland, William
6	Rundle, J. N.
8	Runyon, Solomon
4	Rupley, R.
1	Russell, John S.
2	Sac'to Valley Beet Sugar Co.
6	Saint Ignatius College
1	Salamander Felting Co.
3	Salt Water Bathing Co.
9	Samisch, E.
2	Samuels, D.
2	Samuels, L.
4	Sanborne & Byrne
5	San Francisco and Pacific Glass Works
3	San Francisco Candle Co.
1	San Francisco Chronicle Co.
2	San Francisco Cordage Co.
5	San Francisco Gas Light Co.
9	San Francisco Journal of Commerce
1	San Francisco Gold and Silver Plating Works
2	San Francisco Produce Exchange
1	Savage & Son

Section.	
1	Schultz & Fischer
1	Selby's Smelting and Lead Works
4	Severance & Peck
5	Shattuck & Fletcher
6	Sheldon, Mark
1	Shepman, William
4	Sherman & Hyde
6	Small, I. H.
3	Smith, Mrs. A. F.
2	Smith, Mrs. Barbara
1	Smith Brothers
6	Smith, A. J.
5	Smith, E. B. & Co.
4	Smith, J. J.
4	Smith, James S.
3	Snow, John F. & Co.
1	Snook Bros.
6	Southwick, A. H.
1	Spring, Menzo
5	Standard Soap Co.
6	Stanford, C. P.
2	Star Mills
6	Stearns, W. R.
4	Steele, E.
1	Steiger & Kerr
3	Stettin, Mrs. H.
1	Stevenot & Co.
6	Stipp, H. S.
4	Stockton & Edwards
9	Stokes, William
3	Strauss, Levi & Co.
3	Sullivan, Mrs.
2	Sutherland, Mrs. G.
9	Sutton, M.
9	Swan & Brookes
4	Swan, George W. & Co.
8	Sweetzer & DeLong
1	Swingle, A.
6	Sykes, C. P.
2	Taylor, S. P. & Co.
1	Thompson Brothers
1	Tilden & Co.
2	Townsend, W. S.
2	Townsend, Mrs. and Schnegass, Miss
6	Trueworthy, F. M.
2	Trumbull, R. J.
1	Tuebner & Hoffman
6	Tustin, W. I.
6	Tuthill, Mrs.
3	Una, Jacob
9	Van Der Naillen, A.
1	Vanderslice & Co.
9	Vandall, B. C.
8	Van Norden, R. T.
1	Ventura Rock Soap Co.
2	Vogeley & Bro.
4	Wainwright, Wm.
5	Wakelee, H. P. & Co.
9	Walker, G.
1	Wallman, Bodo
4	Walton, J. R.
2	Ward & Co.
9	Ware, Mrs. Francis
4	Waterhouse & Lester
1	Weed & Kingwell
8	Welton Drying and Preserving Co.
9	Wellington, B. F.
9	Westwater, Mrs.
4	West Coast Furniture Co.
1, 4	West, John
2	Whitney, J. P.
4	Wheat, C. D. & Co.
9	White, G. G.
1, 4, 6	Wiester & Co.
1	Will & Finck
6	Williams, C. J.
9	Williams, Miss Frankie
5	Williams, H. & Co.
9	Wilcox, E. J.
6	Wilcox, W. C. & Co.
2	Windmuller, Mrs.
4	Wing, W. H. & Co.
2	Wilson, Mrs.
4	Woerner, David & Co.
3	Woodward's Gardens.
6	Yates, R. H.
1, 5	Yates & Co.
1	Yaw, Hiram
4	Zech, Jacob

ALPHABETICAL LIST OF EXHIBITS.

Section.	Article.	Exhibitor.
1	Abalone Shell Jewelry	R. W. Jackson.
3	Afghan	Mrs. J. P. Murray.
6	Agricultural Implements	Frank Bros. & Co.
6	Agricultural Implements	M. C. Hawley & Co.
6	Agricultural Implements	Linforth, Kellogg & Co.
6	Agricultural Implements	D. M. Osborne & Co.
9	Albums	A. L. Bancroft & Co.
9	Albums	Crocker & Co.
9	Albums	A. Roman & Co.
2	Ale, Boston Ginger	Ward & Co.
2	Almonds	Conrad & Co.
1	Amalgamating Plate	S. F. Plating Works.
6	Amalgamators	Steiger & Kerr.
5	Ammonia Bleaching Soap	Peter Burns.
5	Ammonia, samples of	S. F. Gas Light Co.
1	Anchor, model of	
9	Animals, made from Cements	M. Sutton.
	Apparatus (see Philosophical)	St. Ignatius College.
1	Aquarium	Hermann & Co.
1	Aquarium	Thomas Day.
1	Aquarium	R. F. Rochicioli.
9	Architectural Drawings	S. C. Bugbee & Son.
9	Architectural Drawings	Arthur Nahl.
9	Architectural Drawings	A. Van Der Naillen.
9	Architectural Drawings	J. W. Bones.
2	Arrow Root (2 glass jars)	Robert Reed.
1	Artificial Limbs	Menzo Spring.
1	Artificial Stone	Eureka Stone Manufacturing Co.
5	Artists' Materials	Hueter Bros. & Co.
1	Asbestos, Felting, Steam-packing, Paint Roofing, and Cement	I. L. Merrell, Agent.
1	Asbestos, Felting, Steam-packing, and Cement	Salamander Felting Co.
1	Asbestos, American	J. S. Eskins.

Section.	Article.	Exhibitors.
1	Axles, steel	L. W. Beauman, Agent.
3	Axminster Carpets	C. M. Plum & Co.
2	Awnings, patent	W. H. Burton.
3	Bags, bullion; Bucket, fire, etc.	H. N. Cook.
4	Balusters and Rails	B. H. Freeman & Co.
4	Balusters and Rails	Sanborn & Byrne.
1	Bank Vaults	Jonathan Kittredge.
2	Bark, from the Big Tree "Andrew Jackson," Mariposa Group, 112 feet in circumference	Mrs. Chas. E. A. Baxter.
1	Barkeeper's Outfit	Will & Finck.
2	Barley, 135 heads from one kernel	L. D. Chillson.
2	Barley, white winter	L. Samuels, Portland, Oregon.
1	Barometers, etc	John Roach.
2	Barrels, paper	Flint, Peabody & Co.
4	Barrels	E. K. Howes & Co.
1	Bars, steel	L. W. Beauman.
4	Baskets	Armes & Dallam.
4	Baskets, and Machinery used in manufacturing	West Coast Furniture Co.
6	Batteries, galvanic	Electric Power Co.
4	Bath, family	Dr. Moore.
3	Bathing Materials	Salt Water Bathing Co.
2	Beans, castor	Pacific Oil and Lead Works.
4	Bed, sofa	Hoey & Taylor.
4	Bed, sofa	J. A. Biggers.
4	Bed, invalid's	Benjamin Pollard.
4	Bed Lounge	M. T. Brady.
4	Bed. "Star" spring	J. Gray & Co.
4	Beds, Crandall's spring	Clark, Rickoff & Co.
2	Bedspread, made by a lady 100 years of age	Mrs. Earl Bartlett.
2	Bedspread, log cabin	Mrs. E. J. Brown.
2	Bedspread	Mrs. Cole.
2	Bedspread, patchwork (2)	Mrs. Mary Carrigan.
2	Bedspread, satin ("Flag of our Union," containing 8,330 pieces)	Capt. W. J. Douglass.
2	Bedspread, woven in 1786	Mrs. Elizabeth Garton.
2	Bedspread, eider down	F. Knewing.
2	Bedspread, "Job's patience" (6,000 pieces)	Mrs. H. Kosminsky.
2	Bedspread, crochet	Mrs. Millie C. Lemorine.
2	Bedspread, knitted	Mrs. Millie C. Lemorine.
2	Bedspread, silk	Mrs. B. S. Harrison.
2	Bedspread, crochet	Mrs. M. Kickens.

Section.	Article.	Exhibitors.
2	Bedspread, worsted	Mrs. P. V. Merritt.
2	Bedspread, Turkish fancy	Mrs. Mourgeanna.
2	Bedspread, patch-work	Mrs. Moore.
2	Bedspread (made 96 years ago)	Wm. Rowland.
2	Bedspread, crochet	Mrs. Barbara Smith.
2	Bedspread, knitted	Mrs. G. Sutherland.
2	Bedspread, embroidered	Mrs. Tuthill.
2	Bedspread, patchwork (double Irish Chain)	Miss Jessie Redden.
2	Bedspread, "Centennial,"	Mrs. Wilson.
2	Bedspread, center embroidered in 1757; border, in 1876	Mrs. Windmuller.
2	Bedspreads (2)	Mrs. H. Ebright.
2	Bedspreads (2)	Mrs. S. Kelloch.
1	Beef, dried, Cutter	F. C. M. Fenn.
1	Beer Faucets	Weed & Kingwell.
3	Bees Wax, one case	Littlefield, Webb & Co.
2	Beet Sugar	California Beet Sugar Co.
2	Beet Sugar, samples of	Sacramento Valley Co.
2	Beets, samples of	Sacramento Valley Co.
1	Bell-hanging Materials	Will & Finck.
1	Bell-hanging Materials	Charles Otto.
1	Bell-hanging Materials	Bodo Wallman.
4	Bellows, large	California Bellows Manuf. Co.
4	Bellows, parlor	F. C. M. Fenn.
1	Bells	W. T. Garratt.
1	Bells	Weed & Kingwell.
1	Bells, galvanic	Will & Finck.
1	Bells, Cow and Sheep	Hiram Yaw.
1	Belt Cutters	H. O. Reinhardt & T. B. Isaacs.
3	Belting, Leather	H. N. Cook.
4	Billiard Tables	P. Liesenfeld.
6	Binders, grain	Frank Bros. & Co.
1	Bird Cages	A. S. Hallidie.
1	Bird Cages	Howard & Morse.
	Birds (see Natural History).	
1	Birds, silver (glass case)	J. T. Jennings.
5	Bitters, "California Wine"	Lachman & Jacobi.
5	Bitters, "Herb"	Dr. Renz.
5	Bitters, "I X L"	Dr. Henley.
5	Bitters, "Orange"	Chenery, Souther & Co.
5	Bitters, "Wild Blackberry"	Lachman & Jacobi.
5	Bitters, "Yerba Buena"	Homer Williams & Co.
5	Blacking	H. Lake & Co.
1	Blacksmiths' Tools	Nelson & Doble.
9	Blank-books	A. L. Bancroft & Co.

Section.	Article.	Exhibitor.
9	Blank-books	Crocker & Co.
3	Blankets, cleaned	John F. Snow & Co.
6	Blower, "Golden State"	Palmer, Knox & Co.
6	Blower, Eclipse, Landis' Fan	T. H. King & Co.
3	Bleached Goods	John F. Snow & Co.
5	Boiler Composition, for removing incrustations	W. H. Campbell.
1	Boiler Head, made by Pennock & Co	McAffee, Spiers & Aitken.
1	Boiler Plates	L. W. Beauman.
1	Boiler Tubes	Dunham, Carrigan & Co.
1	Bolts, carriage	L. W. Beauman.
9	Books, extra bound	A. Roman & Co.
9	Books, extra bound	A. L. Bancroft & Co.
9	Books, law and miscellaneous	A. L. Bancroft & Co.
3	Boots and Shoes	P. Kelly.
5	Bottles	S. F. and Pacific Glass Works.
5	Borax	Rhodes & Wason.
5	Borax in all forms	Smith Bros.
5	Borax in all forms	E. K. Stevenot & Co.
4	Boxes, dovetailed for berry, butter, hat and soap; also, berry and butter chests	Geo. W. Swan & Co.
	Boys' and Girls' Aid Society.	
3	Boys' Clothing	Joseph Bros.
1	Butts, Spiral Spring	Charles Otto.
1	Brackets, ornamental	R. F. Rochicioli.
7	Brandies, green ginger, apple, Cognac, etc	Chenery, Souther & Co.
7	Brandy, blackberry	Dr. Renz.
7	Brandy, grape	Lachman & Jacobi.
7	Brandy, grape.	Kohler & Frohling.
1	Brass Padlocks	B. Wallman.
4	Brass Musical Instruments	Sherman & Hyde.
6	Brewing, mashing attemporator for	Wm. Padden.
1	Brick, fire	J. B. Owens & Co.
1	Brick, fire (from Utah Territory)	S. F. Journal of Commerce.
1	Brick, steatite	I. L. Merrell.
4	Brooms, of all kinds	Eureka Broom Factory.
4	Brooms, stable	Cal. Brush Co.
1	Bronze Hardware	Dunham, Carrigan & Co.
1	Bronzes	B. Nathan & Co.
1	Bronzes	Ruply & Parker.
1	Bronzes	Thomas Day.
1	Bronzes	R. F. Rochicioli.
4	Brushes	Eureka Broom Factory

Section.	Article.	Exhibitor.
5	Brushes and Artists' Materials	Hueter Bros. & Co.
4	Brushes, comprising clothes, paint, whitewash, window, etc.	Cal. Brush Co.
6	Bucket, Craven's self-dumping	H. S. Cravens.
1	Building Stone, from California quarries	S. F. Journal of Commerce.
3	Buckle, hose and suspender	Mrs. H. B. Maxfield.
1	Burner, Stockwell's self-lighting	Hakes & Carroll.
3	Bustles	M. Freud & Son.
4	Buttons, sleeve (wood)	C. F. Atkinson.
4	Buttons, sleeve (wood)	R. W. Brehm.
1	Buttons, separable sleeve	Pacific Jewelry Co.
1	Butts, case of fancy	M. C. Hawley & Co.
4	Cabinet (model)	J. Hendrickson.
1	Cabinets, printers'	Painter & Co.
1	Cage, squirrel, "Centennial Palace,"	John West.
3	Candles, samples of Crystal Wax	S. F. Candle Co.
2	Candy, French and American	J. Vogeley & Bros.
2	Candy, crystal rock, fancy and plain	W. S. Townsend.
2	Candy and Syrup	Cal. Rock Candy Co.
8	Canned Fruits, Meats, etc.	C. Jas. King of Wm. & Co.
6	Car, prismoidal	Pacific Railway Car Co.
6	Car, single track	D. B. James, of Visalia.
6	Car-box Lubricators	Steiger & Kerr.
1	Car-wheel, for turning curves	Anson S. Lerake.
3	Carpets, Axminster	C. M. Plum & Co.
3	Carpets, domestic	Alex. Mackey.
3	Carpets, Axminster and Tapestry	Bell, Gullixson & Co.
6	Carpet Sweeper, improved	J. C. Pinkham.
6	Carpet (Home) Beating Machine	Chas. Elsasser.
6	Carpet Sweepers	Cal. Brush Co.
4	Carriages	Holcomb Bros. & Co.
6	Carriages	Carvill Manufacturing Co.
6	Carriages	H. M. Black & Co.
6	Carriages	Larkins & Co.
6	Carriages	Crego & Bowley.
6	Carriages, Oppenheim's patent	E. Steele.
6	Carriage	W. Hackett.
6	Carriage	B. Gallagher.
6	Carriage Materials	T. H. King & Co.
6	Carriage Materials	Meeker, James & Co.
1	Cases, metal show	Tuebner & Hoffman.
5	Casket of Venus	H. A. Bradford.

Section.	Article.	Exhibitor.
4	Cask for Wine (3,500 gallons)	Fulda Bros. & Co.
4	Cask for Wine (4,000 gallons)	David Woerner & Co.
1	Castings of Cast Steel	J. C. Bidwell, of Pittsburg.
1	Castings of Iron	Steiger & Kerr.
1	Castings of Iron	S. F. Journal of Commerce.
1	Castings of Iron	Low & Chartrey.
1	Castings of Iron	Ætna Iron Works.
1	Castings of Malleable Iron	L. W. Beauman, Agent.
5	Catarrh Remedy "Main Leaf"	N. S. Coon.
1	Cement, asbestos	Salamander Felting Co.
1	Cement, steatite	I. L. Merrell.
6	Centennial Roasting Apparatus	C. J. Williams.
4	Center Table, inlaid and carved	C. J. Larsen.
2	Cereals	Deaf, Dumb, and Blind Asylum, Oakland.
2	Cereals, twelve jars	Isaac Friedlander.
2	Cereals, from all parts of the world	J. H. Campbell.
1	Chain, Furnace, and Forge	Jas. E. Gordon.
4	Chair, ordinary spring	B. C. Brown.
4	Chairs	Heywood Bros.
7	Champagne, consisting of Dry, Sillery, Eclipse, Private Cuvee, Muscatel, etc.	I. Landsberger & Co.
1	Chandeliers	Yates & Co.
1	Chandeliers	Thomas Day.
5	Chemical Wonder	Hill & Beebee.
9	Charts, Royal and Bazaar Patterns	Mme. Morrow & Co.
9	Charts, for cutting garments	Mrs. Ralph.
4	Chests, kitchen accommodation	Geo. McIntyre.
1	Chilled Iron Rolls	Steiger & Kerr.
1	Chimney Pipes	C. D. Paul.
1	Chimney Stacks, patented salamander	J. Browell.
1	Chimney Jack	Geo. Hayes & Co.
1	"Chronicle," San Francisco, Stereotype Plates and Moulds	S. F. Chronicle Co.
8	Cider	Sweetzer & DeLong.
8	Cider, champagne	C. Jas. King of Wm. & Co.
6	Cider Mill	Frank Bros. & Co.
8	Cider Vinegar	Sweetzer & DeLong.
4	Clarence, glass front	H. M. Black & Co.
4	Clarence, square front	Carvill Manufacturing Co.
4	Clarence, square front (2)	B. Gallagher.
6	Clocks	Thomas Day.
3	Clothing	Poheim & Lancaster.
3	Clothing, boys'	Joseph Bros.

Section.	Article.	Exhibitor.
3	Clothing, custom made.	Lancaster & Northon.
2	Cloth Quilt (Tapa), made from the bark of trees at Navigator's Island	Major J. M. Broom.
4	Coach, "Baldwin House"	Carvill Manufacturing Co.
1	Coal, Iron Ore	S. F. Journal of Commerce.
2	Coffee, wild, grown near Columbia, Tuolumne Co.	T. H. Follingsby.
5	Cologne, Hoyt's German	N. S. Coon.
5	Colors, fifty-eight varieties	Hueter Bros. & Co.
1	Compasses	John Roach.
1	Composition, for removing incrustations from steam boilers	W. H. Campbell.
6	Concentrators	Joshua Hendy.
6	Concentrators (Centennial)	C. P. Robbins.
3	Condensed Eggs	S. Foster & Co.
1	Copper and Garratt Metal	W. T. Garratt.
1	Copper Ore	Red Mountain Copper Co.
1	Copper Ware	J. M. Bryan.
1	Copper Ware	Holbrook, Merrill & Co.
3	Coral, branches	Major J. M. Broom.
2	Cordage, comprising Manila tarred lanyard, Manila tarred lathyarn, Manila bale rope, Sisal bale rope, Manila hemp, Manila rope, Manila mining rope	S. F. Cordage Co.
6	Corn-sheller and Hay-cutter combined	C. Donner & C. Suhl.
1	Corrugated Stove-pipe Elbows	Wm. Wehmoller.
2	Corsets and Shoulder-braces	Mrs. M. McGrath.
2	Corsets and Shoulder-braces	Miss A. W. Baker.
2	Corsets and Shoulder-braces	M. Freud & Son.
2	Corsets and Shoulder-braces	Lyman Alexander.
2	Corsets and Shoulder-braces	Miss M. McGrill.
2	Cotton, California plant in bloom, grown near Colusa, California	S. F. Journal of Commerce.
2	Cotton, five samples of	Merchants' Exchange.
2	Cotton, Sea Island	A. Crawford & Co.
	Coverlids. See Bedspreads.	
9	Crayopaques (a collection of portraits)	Arthur Nahl.
9	Crayon (portrait of Mr. Geo. Rignold, as Henry V)	Carl Browne
9	Crayon (portrait of the artist)	A. Hossack.
5	Creme de Lis	Geo. S. Dickey.
1	Crucible, iron	L. W. Beauman.

Section.	Article.	Exhibitor.
6	Crusher, corn and cob	M. C. Hawley & Co.
6	Cultivator, Riesling	Linforth, Kellogg & Co.
	Curios. See Japanese Goods	
1	Currier Knives	Pacific Saw Co.
1	Currier Knives	W. F. Palmer.
2	Curtain and Curtain Fixtures	Hartshorn & McPhun.
1	Cutlery, etc	Will & Finck.
1	Cutters, card	Will & Finck.
1	Cutters, card, paper, etc	Painter & Co.
1	Cuts, electrotype, stereotype, etc	Painter & Co.
9	"Daily Fair Press"	Dewey & Co.
5	Dentistry, case of	Drs. Cochrane & Richmond.
5	Dentistry, case of	Dr. Charles E. Blake, Sen.
5	Dentistry	W. S. Beebee.
5	Dentistry	D. S. Hutchinson, D. D. S.
5	Demijohns	Armes & Dallam.
5	Demijohns	S. F. & Pacific Glass Works.
6	Derrick, model of	N. Mattick.
5	Demijohns, patent tule-covered	Carlton Newman.
4	Desks, office, Wooton patent	B. C. Brown.
4	Desks, patent folding	A. B. Childs.
4	Desks, school	A. L. Bancroft & Co.
4	Desks, school	Gilbert & Moore.
4	Desks, school	Hubbard & Co.
4	Desks, school	A. Roman & Co.
9	Directory, Bishop's S. F.	B. C. Vandall.
5	Disinfecting Fluid	California Fertilizing Co.
6	Ditching Machine	Price Press Co.
6	Ditching Machine, Reichart's patent model	H. S. Stipp.
4	Dog Carts	Crego & Bowley.
1	Dog Collars	E. H. Marwedel.
6	Dovetailing Machine	Geo. W. Swan & Co.
4	Drawers, money, etc	Geo. W. Swan & Co.
9	Drawing, architectural	Arthur Nahl.
9	Drawing, architectural	Wm. Stokes.
9	Drawing, architectural	S. C. Bugbee & Son.
9	Drawing, architectural	J. W. Bones.
9	Drawing, architectural, etc	A. Van Der Naillen.
9	Drawing, mechanical	H. C. Langrehr.
9	Drawings, crayon	G. Walker.
9	Drawings, crayon	Carl Brown.
9	Drawings, pen	D. S. Dow.
9	Drawing, pen	John L. E. Firman.
9	Drawing, pen	Heald's Business College.

Section.	Article.	Exhibitor.
9	Drawings, pencil	Edward Newman.
9	Drawings, pencil	G. T. Walker.
9	Drawings, pen	L. K. Mihills.
9	Drawings, colored	Mrs. Dr. French.
4	Dressing Case, inlaid	J. Hendrickson.
3	Dressing Gown, eider down	F. Knewing.
6	Drill, "Buckeye"	M. C. Hawley & Co.
6	Drill, grain	Frank Bros. & Co.
1	Drills and Sockets	C. Allison.
1	Drills, twist	Charles Otto.
1	Drills, hand	Giant Powder Co.
3	Dusters, feather	Armes & Dallam.
3	Dusters, feather	Jacob Unna.
3	Dyed Goods, samples of	John F. Snow & Co.
1	Earthenware	Bergeman & Bro.
1	Earthenware	Sacramento Pottery, J. B. Owens, Agt.
1	Earthenware	D. Nathan & Co.
1	Edged Tools	W. F. Palmer.
3	Eggs, condensed	S. Foster & Co.
3	Eider Down Goods	F. Knewing.
1	Elaine Oil	Grant & Co.
1	Elastic Cork Truss	Wm. Beman.
1	Elbow Corrugated Stove Pipe	Wm. Wehmoller.
6	Electrical Apparatus	California Electrical Power Co.
6	Electrical Apparatus	St. Ignatius College.
6	Electrical Apparatus	Will & Finck.
1	Electrical Body Brush	H. Gosling, Agent.
1	Electrotypes	Painter & Co.
4	Elevator and Twin Staircase	S. Gray.
3	Embroidery, baby shawl	Mrs. C. T. Butler.
3	Embroidery, case of	Mrs. Annette Clark.
3	Embroidery	Miss M. McGrill.
3	Embroidery, tidy	Mrs. M. Kickens.
3	Embroidery, crochet tidies (2)	Mrs. E. Lentall.
3	Embroidery, bead pin-cushions(2)	Mrs. E. Lentall.
3	Embroidery (3 pieces)	Mrs. Eliza Pritz.
3	Embroidery and Laces	D. Samuels.
3	Embroidery Stamping, case of	Mrs. H. Stettin.
3	Embroidery Stamping, case of	Mrs. Sullivan.
	Emigrant Family crossing the Plains (model of)	J. H. Gilmore, Agent.
9	Engineering Drawing	A. Van Der Naillen.
9	Engineering Drawing	H. C. Langrehr.
6	Engine, "Hoadley's"	Frank Bros. & Co.
6	Engine, hoisting	Hawkins & Cantrell.
6	Engine, "Trade"	M. C. Hawley & Co.

Section.	Article.	Exhibitor.
6	Engine, lathe	Joshua Hendy.
6	Engine, horizontal	Hinckley & Co.
6	Engine, portable steam	M. C. Hawley & Co.
6	Engine, Rider's Compression	Huntington, Hopkins & Co.
6	Engine, straw burner	Ernest Ransome.
6	Engine, "Mansfield" Treshing	Linforth, Kellogg & Co.
9	Engraving, lithographic, zinco-graphic, etc.	A. L. Bancroft & Co.
9	Engraving, poster	Chas. W. Deaves.
9	Engravings, "Men we Know"	Fred. Marriott.
9	Engraving on glass	A. J. Burgen.
9	Engraving on metal, wood, ivory, etc.	G. G. White.
4	Escritoire (model in glass case)	
6	Excavators (box, self-loading and canal)	Price Press Co.
5	Extracts, Flavoring, assortment of	Redington & Co.
5	Extracts, Flavoring, assortment of	J. R. Gates & Co.
5	Extracts, Flavoring, assortment of	S. H. Nicholson.
9	"Fair Press Daily"	Dewey & Co.
3	Farina Lacteous, Nestle's milk-food	H. P. Wakelee & Co.
3	Feather dusters, plumes, etc	Jacob Unna.
3	Feathers, ostrich and others	A. J. Balny.
1	Felting, asbestos	Salamander Felting Co.
1	Felting, steatite	I. L. Merrell, Agent.
1	Files, "Beaver" brand	Jas. E. Gordon.
1	Firearms	A. Swingle.
1	Firebacks for grates	I. L. Merrell, Agent.
1	Firebacks for grates	Savage & Son.
3	Fire buckets	H. N. Cook.
1	Firebricks	J. B. Owens, Agent.
5	Fire Extinguisher, "Holloway's"	A. S. Hallidie.
2	Flax, raw and manufactured	L. Samuels, Portland, Oregon.
4	Fences and step-ladders	Stockton & Edwards.
1	Fenders, brass and bronze, for parlors and sitting-rooms	A. S. Hallidie.
1	Fenders, painted for nurseries	A. S. Hallidie.
3	Fleece, California, Spanish Merino	J. P. Whitney.
3	Fleece, Golden (32 lbs., 11 in.)	Thomas Bailey & Co.
3	Fleece, Shropshire (7 mos., 6½ lbs)	Moody & Farish.
3	Fleece, Ewes (10 mos., 15 lbs.)	Severance & Peck.
3	Fleece, Australian Merino	Robert Reed.
2	Flour, Vallejo, California (superfine)	Star Mills.
2	Flour, Wheatland	Corbett & Mackley, Portland, Oregon.

Section.	Article.	Exhibitor.
9	Flowers, Artificial	Mrs. Townsend & Miss Schnegass.
	Flowers (see Wax Flowers)	
5	Fluid, disinfecting	California Fertilizing Co.
1	Forms, blacksmiths'	Savage & Son.
1	Forms, blacksmiths'	Steiger & Kerr.
1	Forge Moulds	Savage & Son.
1	Forge Moulds	Steiger & Kerr.
1	Fountains, Iron	Savage & Son.
1	Fountains, cast iron	J. M. Keeler & Co.
1	Fountains, glass	J. M. Keeler & Co.
1	Fountain, Soda (Matthew's patent, made by Philadelphia Soda Fountain Co.)	Jas. H. Gates.
1	Fountain, Soda (made by Chas. Lippincott & Co., Philadelphia)	Newman & Bennett.
1	Forge and furnace for making chains	Jas. E. Gordon.
9	Frames and passe-partouts.	Louis Dampf.
4	Frames, two-pine cone	Walter Phelps.
8	Fruits, etc., dried	Alden Preserv'g Co., Gen. Dietzler, Agt.
8	Fruits, preserved	C. Jas. King of Wm. & Co.
8	Fruits, preserved.	Welton Drying and Preserving Co.
5	Fruit Jars	S. F. & Pacific Glass Works.
1	Furnace and Condenser for Quicksilver ores	John Roach.
1	Furnace Screens	J. W. Quick.
3	Furnishing Goods, Gent's	P. Beamish & Co.
4	Furniture, bedroom, parlor and dining-room	California Furniture Co.
4	Furniture, bedroom, parlor and dining-room	Bell, Gullixson & Co.
4	Furniture, bedroom, parlor and dining-room	Goodwin & Co.
4	Furniture, bedroom, parlor and dining-room (with sofa bed)	Hoey & Taylor.
4	Furniture, bedroom, parlor and dining-room	C. H. Plum & Co.
4	Furniture, bedroom, parlor and dining-room (manufactured for Baldwin's Hotel)	West Coast Furniture Co.
4	Furniture, office	B. C. Brown.
4	Furniture, office	E. A. Hubbard.
4	Furniture, school	A. Roman & Co.
4	Furniture, school	A. L. Bancroft & Co.
4	Furniture, school	E. A. Hubbard.
4	Furniture, school	N. B. Childs.

Section.	Article.	Exhibitor.
4	Furniture	Gilbert & Moore.
3	Furs, cleaned	Jno. F. Snow & Co.
3	Furs, sewed and dyed	Mrs. I. Ash.
1	Fuses	Giant Powder Co.
1	Galvanic bands, belts and pulvermachers	John S. Russell.
1	Galvanic body brush	H. Gosling.
1	Galvanized iron work	Geo. Hayes & Co.
6	Gang Plows (2)	E. N. Dalton.
6	Gang Plows, "Myers"	Linforth, Kellogg & Co
6	Gang Plows, "Deere"	M. C. Hawley & Co.
6	Gang Plows	Frank Bros. & Co.
1	Garden Ornaments (cast iron)	Thomas Day.
2	Garden Ornaments (cast iron)	J. M. Keeler & Co.
1	Garden Ornaments (wire)	A. S. Hallidie.
1	Garden Ornaments (wire)	Howard & Morse.
1	Garden Ornaments (cast iron)	Savage & Son.
1	Garden Ornaments	R. T. Trumbull.
1	Garratt Metal	W. T. Garratt.
1	Gas Fixtures	Thomas Day.
6	Gas Machine, "Union," self-feeding	Thomas Day.
6	Gas Machine, "Shaler"	E. A. Hubbard & Co.
1	Gasoline	Grant & Co.
1	Gas, "Sunlight" apparatus	Geo. T. Bromley.
1	Gaugers' Tools	Will & Finck.
2	Ginger Ale, Boston	Ward & Co.
1	Gauge Test, steam	W. T. Garratt.
5	Glass, cut, ground, stained, embossed and bent	Thos. O'Neil.
5	Glass, cut, ground, stained, embossed and bent	John Mallon.
5	Glassware, bottles, demijohns, fruit jars, vials, etc.	S. F. & Pacific Glass Co.
5	Glassware	B. Nathan & Co.
1	Glass Roofing	Geo. Hayes & Co.
9	Globes	A. L. Bancroft.
9	Globes	Roman & Co.
1	Globes, gas, etc	Thomas Day.
3	Gloves, cleaned	J. F. Snow & Co.
1	Gongs	W. T. Garratt.
1	Gongs	Weed & Kingwell.
6	Grain Sheller and Hay Cutter combined	Suhl & Donner.
6	Grain Drills	Frank Bros. & Co.

Section.	Article.	Exhibitor.
1	Grain Screens	J. W. Quick.
1	Grate Bars	Steiger & Kerr.
3	Green Turtle, preserved	Rodgers Meyer & Co.
6	Grip Pulley	A. S. Hallidie.
2	Groceries	Bowen Bros.
1	Guns, California made	A. Swingle.
1	Guns	E. Gates.
4	Hack	H. M. Black & Co.
4	Hack	Holcomb Bros. & Co.
5	Hair Producer	Mrs. H. A. Moore.
5	Hair Restorative	Madame Balcear.
5	Hair Restorative	Mrs. Mourgeana.
3	Hair Work, bouquet of flowers	Mrs. Davison.
3	Hair Work, jewelry, etc.	Miss R. Epler.
3	Hair Work (two frames)	Mrs. C. F. Haustorf.
3	Hair Work	Mrs. M. V. Kendall.
4	Handles, sledge, axe and hammer	J. E. Gordon.
1	Hardware, steel square rules, calipers, compasses, taps, fire chucks, etc.	C. F. Marwedel.
1	Hardware, bronze	Dunham, Carrigan & Co.
1	Hardware, edge tools, assortment of	W. F. Palmer.
1	Hardware, general assortment of	M. C. Hawley & Co.
1	Hardware, general assortment of	Linforth, Kellogg & Co.
3	Harness	Main & Winchester.
6	Harrow	Linforth, Kellogg & Co.
6	Harrow	Patent, J. E. Perkinson, of Santa Rosa.
	Harvester (see Agricultural Implements.)	
2	Hat made from pine leaves	Mrs. J. H. Nevins.
6	Hay Cutter and Grain Sheller	Donner & Suhl.
6	Hay Presses, "Eclipse"	Price Press Co.
6	Health Lift, Johnson's patent	Dr. Moore.
6	Health Lift, Mann's	O. R. Coe.
1	Head Lights	Pacific Lamp and Reflector Co.
3	Honey	C. Jas. King of Wm. & Co.
2	Hops	A. Cleveland, Alameda.
6	Horse Clipping Machine	M. Dunn.
1	Horse Rack, Iron	J. M. Keeler & Co.
1	Horse Shoe Nails	Huntington, Hopkins & Co.
4	House, model of	T. G. Hanzsche.
6	Hub Boring Machine	T. H. King & Co.
1	Hydraulic Nozzles	Wm. T. Garratt.
1	Hydraulic Nozzles	Weed & Kingwell.
6	Ice Machine	Lyon & Co.
1	Illuminating and Ventilating Tiles	Thompson Bros.

Section.	Article.	Exhibitor.
5	Incrustation Composition, for removing incrustations from steam boilers	W. H. Campbell.
5	Inks	A. L. Bancroft & Co.
5	Inks	Crocker & Co.
5	Inks	A. Roman & Co.
5	Inks, printing	Shattuck & Fletcher.
6	Inventions, useful (patented)	Wiester & Co.
1	Instruments, surveying	John Roach.
6	Instruments, philosophical	St. Ignatius College.
1	Iron Cast Propellers	Ætna Foundry.
1	Iron Cast Propellers	Hope Iron Works.
1	Iron Chilled Rolls	Steiger & Kerr.
1	Iron Crucible	L. W. Beauman.
1	Iron, malleable	L. W. Beauman.
1	Iron Castings	Steiger & Kerr.
1	Iron Castings	Low & Chartrey, Agents.
1	Iron, galvanized	Geo. Hayes & Co.
1	Iron Goods, ornamental	J. M. Keeler & Co.
1	Iron Ore, from Oregon	J. Bluxome & Co.
1	Iron Ore and Pig	Oregon Iron Co., Oswego, Oregon.
1	Iron Pipes, steam and water, of all sizes	Dunham, Carrigan & Co.
6	Irrigation Meters (model)	Mons. Guerin.
6	Jack, Hercules Lever	W. R. Stearns.
6	Jack, Improved Lifting	W. T. Garratt.
6	Jack, Power Lifting	Joshua Hendy.
4	Japanese Goods, comprising cabinets, bronzes, chests, carved goods, curios, fans, ivory goods, porcelain, silks, vases, writing cases, etc	Rupley & Parker.
1	Japanned Ware	J. M. Bryan.
8	Jellies and Jams	C. Jas. King of Wm. & Co.
1	Jewelry, abalone shell	R. W. Jackson.
1	Jewelry, gold and silver plated	Pacific Jewelry Co.
3	Jewelry, hair, etc	Miss R. Epler.
4	Kitchen Accommodation Chest	Geo. McIntyre.
4	Kitchen Tables, etc. (Townsend's patent)	E. Hook, Oakland.
4	Kitchen Household Treasures	E. Hook, Oakland.
1	Knives, curriers'	Pacific Saw Co.
1	Knives, planers	Pacific Saw Co.
1	Knives, section	D. M. Osborn & Co.

Section.	Article.	Exhibitor.
4	Knives, drawing	W. F. Palmer.
6	Knitting Machine, Bickford's	M. G. Griffin.
2	Ladies' Underwear, case of	M. Freud & Son.
2	Ladies' Underwear, "Boston Dress Reform"	Miss A. W. Baker.
	Ladies' Underwear (see Embroidery.)	
2	Ladies' Underwear, case of	D. Samuels.
2	Lace Tidies	Miss Frances Ware.
2	Laces and Embroideries	D. Samuels.
2	Laces, cleaned and mended	Mrs. H. Cantel.
2	Laces and Insertion (hand made)	Mrs. Herman.
2	Lacteous Farina, "Nestle's Milk Food"	H. P. Wakelee & Co.
4	Ladders, Patent Step	E. M. Benjamin.
4	Ladders, step	Stockton & Edwards.
1	Lamps, ship's, of all kinds	E. T. Bucknam.
1	Lamps and Lanterns of all kinds	Pacific Lamp and Reflector Co.
1	Lamps, Kendall's hydrostatic	W. G. Halsey & Co.
1	Lamps, glasses, etc.	Yates & Co.
4	Lasts, boot-trees, etc	W. H. Wing & Co.
6	Lathes, wood turning	C. F. Atkinson.
6	Lathes, wood turning	R. W. Brehm.
1	Lathe, dogs	L. W. Beauman.
6	Lathe, engine	Joshua Hendy.
1	Lava from Hawaiian Islands	J. J. Agnew.
9	Law Blanks	A. L. Bancroft & Co.
6	Lawn Mowers	Jas. E. Gordon.
6	Lawn Mowers	R. J. Trumbull.
1	Lead Colors, assorted	Golden State White Lead & Color W'ks
1	Lead, pig, pipe, shot, etc.	Selby Smelting and Lead Co.
1	Leads and Cutters	Painter & Co.
3	Leather Belting, also bullion bags, fire buckets, etc	H. N. Cook.
3	Leather, calf and kip skins	Pardini & Debant.
3	Leather, harness, made at Santa Cruz	J. C. Johnson & Co.
3	Leather, sole	Sam'l C. Gray.
1	Levels	Osborn & Alexander.
9	Lithographic Printing	A. L. Bancroft & Co.
9	Lithographic Printing	Crocker & Co.
5	Lithographic Printing Inks	Shattuck & Fletcher.
6	Loom for Weaving Wire Cloth	A. S. Hallidie.
4	Lounge Bed	M. T. Brady.
1	Locks	Jas. E. Gordon.
1	Lubricator, patent car	Steiger & Kerr.

Section.	Article.	Exhibitor.
4	Machine for making Baskets	West Coast Furniture Co.
6	Machine, Threshing, "Chicago Pitt's"	Linforth, Kellogg & Co.
6	Machine, dovetailing	Geo. W. Swan & Co.
6	Machine, "Dicey's" patent gang edgers	Potter & Bailey.
6	Machine, Mackey, Walker & Co's gang lath	Potter & Bailey.
6	Machine, lath binder	Potter & Bailey.
6	Machine, horse clipping	M. Dunn.
6	Machine for making Ice	Lyon & Co.
6	Machine, hub boring	T. H. King & Co.
6	Machine, mortising	Osborn & Alexander.
4	Machine, moulding, (rope and spiral)	C. Leonard.
6	Machine, shingle	I. H. Small.
6	Machine, shingle	F. A. Huntington.
6	Machine, silk braiding and spooling	Cal. Silk Manufacturing Co.
1	Machinists' Tools	C. F. Marwedel.
1	Machinists' Tools	Chas. Otto.
1	Machinists' Tools	W. F. Palmer.
3	Mail Bags, Leather	H. N. Cook.
5	"Main Leaf" Catarrh Remedy	N. S. Coon.
1	Malleable Iron Castings	L. W. Beauman.
1	Mantel Grates, Iron	Savage & Son, Agents.
1	Mantel Pieces and Grates, white marble	John Daniels.
1	Mantel Pieces and Grates, marble	J. & F. Kessler.
1	Mantel Pieces and Grates, colored marble	L. R. Myers & Co.
1	Mantel Pieces and Grates, white marble	L. R. Myers & Co.
1	Mantel Pieces and Grates, marble	A. Paltenghi.
1	Mantel Pieces and Grates, marbleized, assortment of	Locke & Montague.
1	Mantel Pieces and Grates (Eureka Mantel Works)	G. A. Potter, Agent.
9	Map in relief of California and Nevada	S. F. Journal of Commerce.
9	Maps	A. L. Bancroft & Co.
1	Marble Levatories	Thomas Day.
1	Mathematical Instruments	John Roach.
4	Mattress, "Champion"	A. Nachman.
4	Mattress, "Crandall's Wire"	Clark & Rickoff.
4	Mattress, "St. Louis" woven wire	Gilbert & Moore.

Section.	Article.	Exhibitor.
4	Mattress, Union wire	T. S. Clark.
4	Mattress, wire	J. Gray & Co.
8	Meats, canned, preserved, etc.	C. Jas. King of Wm. & Co.
1	Meat Shavers	F. C. M. Fenn.
9	Medallions, framed (2)	Mrs. Buttlemann.
5	Medicine, patent	Walter Hyde.
5	Medicine, patent	J. R. Gates & Co.
4	Meter, irrigation (model of)	Mons. Guerin.
1	Metallic Bars	E. K. Stevenot & Co.
1	Metallic Letters	C. F. Marwedel.
1	Microscope "Bonanza"	Wiester & Co.
6	Mill, "Challenge" feed	M. C. Hawley & Co.
6	Mill, cider	Frank Bros. & Co.
6	Mill, coffee	Linforth, Kellogg & Co.
6	Mill, coffee	M. C. Hawley & Co.
6	Mill, portable	Berringer & Co.
6	Mill, quartz	Stephen Kendall.
6	Mill, quartz (5 stamps)	Prescott, Scott & Co.
3	Millinery	Mrs. M. E. Anderson.
1	Minerals.	E. K. Stevenot & Co.
4	Model of a Life Boat	Jas. F. Cosgro.
4	Model of a Ship (case)	Peter Bulte.
4	Model of a Ship (case)	C. T. Peters.
4	Money Drawers	Geo. W. Swan & Co.
1	Monuments, zinc.	Gray & Winslow.
4	Mosque, Turkish.	Dr. A. M. Loryea.
2	Moss Albums	Mrs. A. G. Nye.
2	Mosses, sea	Mrs. A. G. Nye.
2	Mosses, sea (framed)	Albert G. Nye.
1	Moulders' Tools	C. F. Marwedel.
4	Mouldings, rope and spiral	C. Leonard.
1	Moulds, metal ornamental work	Ætna Foundry.
6	Mower, lawn	R. J. Trumbull.
6	Mower, lawn, "Monitor"	Jas. E. Gordon.
5	Mucilage	A. L. Bancroft & Co.
5	Mucilage	Crocker & Co.
5	Mucilage	A. Roman & Co.
4	Musical Instruments of all kinds	Sherman & Hyde.
4	Music Racks	Sherman & Hyde.
4	Music Racks	Jas. S. Smith.
9	Music, in sheets	Jas. S. Smith.
9	Music, in sheets	Sherman & Hyde.
1	Nails, horse-shoe.	Huntington, Hopkins & Co.
3	Natural History, comprising a collection of shells and bird skins	Theo. Hermann & Co.

Section.	Article.		Exhibitor.
3	Natural History, collection E. F. Lorquin & Co., comprising:		
1	Scarlet Tanager, Central America	47	Oriole, Philippine Islands
2	Barn Swallow, California	48	Gopher Snake, California
3	Blue-backed Kingfisher, Africa	49	Cock of the Rocks, Peru
4	Rock Wren, California	50	Swallow Humming-Bird, Brazil
5	Blue Creeper, Panama	51	Regent Bird, Australia
6	Canary Bird, Domestic	52	Toucan, Nicaragua
7	Small Quail, Philippine Islands	53	Sun Bird, Philippine Islands
8	" " "	54	Bee Eater, Africa
9	Least Glossy Starling, Africa	55	Septicolore, Central America
10	Golden Crowned Sparrow, Cal.	56	Blue Creeper, Panama
11	Orange Crowned Warbler, Cal.	57	Hum-bird, Central America
12	Red-billed Kingfisher, Phil. Is.	58	Tri-color Finch, Central America
13	Sulphur Rump Tanager, Nic'gua	59	Hum-bird, Central America
14	Large Glossy Starling, Africa	60	Verdelet Finch, Central America
15	Yellow-throated Bee Eater, Africa	61	Cacao Finch, Central America
16	Cinnamon Teal, California	62	Green Bird, Central America
17	Pita, Philippine Islands	63	Emerald-crested Hum-bird, C. A.
18	Pink-headed Dove, Australia	64	Semipalmated Sandpiper, Cal.
19	Blue-throated Paroquet Phil. Is.	65	Marbled Sparrow, Australia
20	Yellow Warbler, California	66	Ruby Hum-bird, Central America
21	Glossy Starling, Africa	67	Bee Eater, Africa
22	Spotted Cuckoo, Philippine Is.	68	Forked-tail Hum-bird, Cen. Am.
23	Steller's Jay, California	69	Bee Eater, Philippine Islands
24	Gosling, Domestic	70	Sanguinolent Paroquet, Phil. Is.
25	Marmouzet Monkey, Brazil	71	Scarlet Tanager, Central America
26	Red-legged Partridge, Europe	72	Blue-throated Hum-bird, Am. Riv.
27	Brown Cuckoo, Philippine Is.	73	Emerald Hum-bird, Central Am.
28	Least Glossy Starling, Africa	74	Hum-bird, Amazon River
29	Cliff Swallow, California	75	Hum-bird, Central America
30	Red-crowned Tit, Brazil	76	Hum-bird, Guatemala
31	Black-crested Cuckoo, Phil. Is.	77	Curved-bill Hum-bird, Brazil
32	Sparrow Hawk, California	78	Emerald Hum-bird, Brazil
33	Forked Tail Roller, Africa	79	Ruby Emerald Hum-bird, Brazil
34	Lyre Bird, Australia	80	Hum-bird, Amazon River
35	Resplendent Trogan, Guatemala	81	Blue Thrush, Philippine Islands
36	Black-shouldered Hawk, Cal.	82	Little Emerald Hum-bird, C. Rica
37	Mountain Cat, California	83	Hum-bird, Amazon River
38	Long-tailed Glassy Starling, Africa	84	Hum-bird, Central America
39	Wolf and Lamb, Europe	85	Hum-bird, Central America
40	Satin Bird, Australia	86	Hum-bird, Central America
41	Arkansas Goldfinch, California	87	Australian Paroquet
42	Lawrence's Goldfinch, California	88	Hum-bird, Central America
43	Long-eared Owl, California	89	Glossy Starling, Gambia
44	Short-eared Owl, California	90	Mexican Fly-catcher, California
45	Purple Kingfisher, Philippine Is.	91	Fork-tailed Hum-bird, Guatemala
46	Pita, Australia	92	Snowy Owl, Canada

93 Elk's Head, Rocky Mountains
94 Turkey Buzzard, California
95 Chicken Hawk, California
96 Australian Green Pigeon
97 Horn-billed, Callao, Phil. Is.
98 Group of Monkeys, South Am.
99 Golden Eagle, California
100 Night Heron, California

Natural History, collection of Woodward's Garden, comprising:

ANIMALS.—

Order Quadrumana.

Gray Monkey and young, S. America
Marmoset, Central America

Order Cheiroptera.

Bat, North America

Order Insectivora.

Shrew, Europe
Hedgehog, Europe

Order Carnivora.

Leopard, preying on Gazelle, Africa
Puma and young, N. W. America
Ocelot, South America
Lynx, young, California
Civet Cat, Asia
Ichneumon, Africa
Weasel, North America
Zorilla, Africa
Polecat, Northwest America
Ferret, Europe
Fox, Europe
Hyena, young, Africa
Badger, Europe
Black Bear, young, California
Coati, South America
Kinkajou, South America

Order Pinnipedia.

Walrus Head, Arctic Ocean
Leopard Seal, Pacific Ocean
Elephant Seal, Pacific Ocean
Barking Seal, Pacific Ocean

Order Rodentia.

Wild Rabbit, California
Prairie Dog, prairies North America
Woodchuck, North America
Squirrels of N. and S. America
Rocky Mountain Rat, North Ameirca
Prehensile-tailed Porcupine, S. A.
Cavy, South America
Gopher, Europe

Order Edentata.

Little Sloth, South America
Armadillo, South America
Ant-eater, South America
Platypus, Australia
Echidna, Australia

Order Ruminantia.

Dwarf Antelope, Africa
Musk Deer, Java

Order Pachydermata.

Hyrax, South Africa

Order Marsupialia.

Little Opossum, South America
Wallaby, Australia
Ala, Australia
Dasyurus, Australia

BIRDS.—

Order Raptores.

Black Vulture, North America
Bald Eagle, North America
Harpy Eagle, South America
Honey Buzzard, Europe
Sharp Shinned Hawk, N. America
Broad Winged Hawk, N. America
Eagle Owl, Europe
Brown Owl, Europe
Mottled Owl, North America
Dwarf Owl, California

Order Scansores.

Black Cockatoo, Australia
White Cockatoo, Australia
Tricolor Cockatoo, Australia
King Parrot, Australia
Pennant's Parrot, Australia
Undulated Parrot, Australia
Green Parrot, South America
Crimson Lourie, India
Blue Maccaw, South America
Red and Yellow Maccaw, S. America
Dwarf Paroquet, India
Elegant Woodpecker, S. America
Ivory-billed Woodpecker, Mexico
Red-headed Woodpecker, N. America
Yellow-shafted Woodpecker, Cal.
Spotted Woodpecker, Europe
Long-tailed Trogon, Yucatan
Elegant Trogon, Southern Mexico
Cumings' Cuckoo, Philippines
Road Runner, California
Blue Toucan, Central America
Sulphur-breasted Toucan, S. America
Tufted Toucan, Central America
Aracari, Peru

Order Incessores.

Ruby & Topaz Humming-bird, S. Am.
Sword-billed Humming-bird, S. Am.
Tufted Humming-bird, S. America
Anna Humming-bird, California
Rufous Humming-bird, California
Thorn-bill Humming-bird, Central A.
Ruby-throated Humming-bird, N. Am.
Brazil Hill Star Humming-bird, S. Am.
Blue-throated Humming-bird, S. Am.
Emerald Humming-bird, S. Am.
Hermit Humming-bird, S. America
Mango Humming-bird, Mexico
Topaz-throated Humming-bird, C. A.
Wood-star Humming-bird, Peru
Swallow, Europe
Purple Marten, North America
Tree Swallow, India
Night Hawk, North America
Goat-sucker, Europe
Sun-bird, Formosa
Nectarine, South Africa
Spider-catcher, South Africa
Honey-sucker, Australia
Tree-creeper, South America
Blue-creeper, South America
Blue-and-Black-creeper, S. America
Wren, North America
McLay's Kingfisher, Australia
Blue-backed Kingfisher, India
Common Kingfisher, Europe
Laughing Kingfisher, Australia
Indigo Kingfisher, India
American Kingfisher, N. America
Crested Kingfisher, India
Black-backed Kingfisher, Africa
Golden Jacamar, South America
Green Jacamar, South America
Bullock's Bee-eater, Africa
Large Bee-eater, Madagascar
Bee-eater, Australia
Motmot, Central America
Titmouse, Europe
Summer Warbler, North America
Prothonotary Warbler, N. America
Tree Lark, Europe
Red-sided Thrush, Europe
Varied Thrush, North America
Robin, North America
Parson Bird, New Zealand
Thrush, Asia

Pittas (3 varieties), Molucca Islands
Blue Chatterer, Central America
Cayenne Chatterer, Central America
Wax-wing Chatterer, Europe
Umbrella Chatterer, South America
Cock of the Rocks (2 var.), S. Am.
Red-backed Shrike, Africa
Blue Shrike, Java
Bush Shrike, South America
Yellow-bellied Flycatcher, Cent'l Am.
Red Flycatcher, Central America
Spotted-sided Finch, Australia
Yellow Bird, North America
Sparrow, Europe
Linnet, Europe
Java Sparrow, Java
Yellow Ammer, Europe
Finch, Europe
Black-throated Bunting, N. America
Yellow Grosbeak, Mexico
Cardinal, North America
Red-headed Cardinal, South America
Crimson Tanager, Brazil
Scarlet Tanager, North America
Paradise Tanager, Peru
Golden Tanager, South America
Black-headed Tanager, S. America
Cocoa-headed Tanager, S. America
Elegant Tanager, South America
Blue Tanager, South America
Whidah Finch, Africa
Cut-throat Finch, Africa
Starling, Europe
Meadow Lark, North America
Spurred Starling, Central America
Golden Oriole, Philippine Islands
Bullock's Oriole, California
Red-shouldered Blackbird, Cal.
Oriole, Central America
Raven, North America
Crow, North America
Clark's Crow, North America
Jack Daw, Europe
Blue-backed Crow, Central America
Blue Crow, North America
Hornbill, Africa
Magpie, Europe
Steller's Jay, California
Jay, Europe
Long-crested Jay, South America
California Jay, California
Bird of Paradise, New Guinea

Order Rasores.

Crowned Pigeon, New Guinea
Yellow-breasted Pigeon, India
Dwarf Dove, Central America

Order Gallinæ.

Red-legged Partridge, Europe
Massena Partridge, W. North Am.
Gambel's Quail, W. North America
Mountain Quail, Oregon and Cal.
California Quail, California
Japanese Quail, Japan
Ruffed Grouse, North America
Hazel Grouse, Europe
Sand Grouse, Africa
Snow Grouse, North America
Golden Pheasant, China
Impeyan Pheasant, Himalaya

Order Cursores.

Little Bustard, Africa

Order Grallatores.

Blue Heron, North America
Night Heron, North America
Night Heron, Australia
Bittern, Europe
Sun Bittern, Trinidad
Least Bittern, North America
Sacred Ibis, Africa
Glossy Ibis, North America
Scarlet Ibis, Central America
Boat-bill, Central America
Flamingo, South America
Roseate Spoon-bill, South America
Heron, Australia
Purple Gallinule, Central America

Water Rail, Europe
Little Black Rail, California
King Rail, California
Coot, North America
Jacana, Australia
Snipe, Europe
Woodcock, East North America
Avoset, North America
Black-necked Stilt, North America
Black-breasted Plover, N. America
Lapwing, Europe
Oyster Catcher, Europe
Standard Wing Bird of Paradise, Wagiou
Rifle Bird, Australia
Colie, Africa
Plantain-eater, Africa
Roller, Europe
Roller, Africa
Manakins (four varieties), S. Am.
Turnstone, North America
Sandpiper, North America

Order Natatores.

Falkland Goose, South America
Brant, North America
Dwarf Goose, Australia
Spoonbill, Europe
Velvet Duck, North America
Harlequin Duck, Arctic America
Widgeon, North America
Red-breasted Teal, California
Common Teal, North America
Mandarin Duck, China
Summer Duck, North America
White-eyed Duck, Europe
Diver, North America
Grebe, Europe
Eared grebe, North America
Razor-billed Auk, North America
Little Penguin, New Zealand
Murre (young and eggs), Farallones
Sea Pigeon, Farallones
Sea Parrot, Arctic Ocean
Marbled Guillemot, North America
Cassin's Auk, North America
Albatross, Australia
Petrels (two varieties), At. Ocean
Gulls (three varieties), North Am.
Terns (two varieties), North Am.

REPTILIA.—

Order Testudinata.

Tortoise, South America
Chinese Turtle, China
Terrapin, North America
Chelodine, Mexico

Order Crocodilia.

Alligator, South America
Young Alligator, North America

Order Sauria.

Iguana, Central America
Tree Lizzard, Central America
Stump-tailed Lizzard, Australia

Order Ophidia.

Boa Constrictor, South America
Mexican Coral Snake, Central Am.

BATRACHIANS.—

Order Anura.

Toad, California
Frog, California

PICES.—

Red Perch, Mexico
Balliste, Atlantic Ocean
Carp, Europe
Shark, Atlantic Ocean
Spined Shark, California
Sea Owl, South Pacific Ocean

CRUSTACIA.—

Rock Crab (two varieties), N. Pac. O.

OOLOGICAL SPECIMEN.—

Eggs of Blue Jay, Atlantic States

Eggs of Meadow Lark, Atlantic States

Eggs of Robin, North America

Eggs of Cat Bird, Atlantic States

Eggs of Golden-winged Woodpecker, Atlantic States

Section.	Article.	Exhibitor.
9	Needlework and Fancy Articles, made by Chinese girls in Union Mission School	Rev. Dr. Loomis.
9	Needlework	Mrs. Alexander.
9	Needlework, ornamental (2) pieces.	Mrs. Mangenberg.
9	Needlework (2) pieces	J. D. Robertson.
9	Needlework (3) pieces	Mrs. E. S. Regensberger.
9	Needlework (2) pieces	Miss Frances Ware.
4	"Niantic," relics of the ship	J. T. Jennings.
9	Octagon, revolving statistics of Pacific Coast Products	S. F. Journal of Commerce
4	Office Furniture	B. C. Brown.
4	Office Furniture	California Furniture Co.
4	Office Furniture	Goodwin & Co.
4	Office Furniture	Hoey & Taylor
4	Office Furniture	West Coast Furniture Co.
2	Oil, boiled and raw, linseed	Pacific Oil & Lead Works.
2	Oil, cake	Pacific Oil & Lead Works.
2	Oilcloth, Cal. made	H. Corbett.
2	Oil, cold pressed (castor)	Pacific Oil and Lead Works,
1	Oil colors, assorted	Golden Gate White Lead and Color Works.
3	Oil, samples of refined and crude whale	Hutchings & Co.
3	Oil, samples of refined and crude whale	Pacific Rubber Paint Co.
1	Oil, Elaine and Gasoline	Geo. W. Grant & Co.
1	Oil, Coal, samples of, comprising crude, 40°; gravity, illuminating, fire test, 115°; lubricating, 18°; machine, 26°	Fred. A. Clark, of San Fernando.
3	Oil, samples of	Phœnix Oil Works.
1	Oil Stove, "The Florence"	Samuel Hill.
1	Oil Stove, "Monitor"	Tilden & Co.
1	Oil Stove, "Covey's Cottage Kitchen"	Benjamin Collins.
1	Ore, copper	Red Mountain Copper Co.

Section.	Article.	Exhibitor.
6	Ore Feeders, "Tulloch's"	F. Ogden.
6	Ore Feeders, "Stanford's"	C. P. Stanford.
6	Ore Feeders, "$1,000 Challenge."	Joshua Hendy.
1	Ore, iron from Oregon	J. Bluxome & Co.
4	Organs, "Geo. Woods"	W. G. Badger.
4	Organ, "Church"	John Bergstrom.
4	Organs, "Jubilee"	James S. Smith.
4	Organs, "Standard"	Sherman & Hyde.
4	Organs, "Cottage"	Chas. S. Eaton.
3	Oysters, Pickled	C. Jas. King of Wm. & Co.
1	Padlocks, brass (patent)	B. Wallmann.
1	Paintings in Oil. (See Art Gallery Catalogue and Section IX.)	
9	Painting, in oil	Jennie E. Clark.
9	Painting, in oil, "Suisun Bay"	Jennie E. Clark.
9	Painting, in oil, "South Dome" and "Washington Column," "Yosemite Valley"	Jennie E. Clark.
9	Painting, in oil, "Magdalen"	Mrs. Westwater.
9	Painting, in oil, "Thomas Paine."	A. L. Ballou.
9	Painting, in oil, "Sacred Heart." Painted by Roger Van Der Laden, in the year 1698; was formerly the altar piece of the old mission ship "San Carlos," which arrived on this coast in the year 1771	Captain D. Brown.
9	Paintings, in oil	Swan & Brooke.
9	Paintings, in oil	A. Hossack.
9	Paintings, in oil	Arthur Nahl.
9	Paintings, in oil	Mrs. H. Gillin.
9	Paintings, in water colors	Mrs. Emily R. Eastman.
9	Paintings, in water colors	Mrs. Dr. French.
9	Paintings, in water colors	Mrs. W. Ireland, Jr.
9	Paintings, on porcelain	R. Samisch.
9	Paintings, on porcelain	B. Nathan & Co.
9	Paint, steatite	I. L. Merrell, Agent.
1	Paints, assorted colors	Golden Gate White Lead and Color Works, Sullivan, Kelly & Co., Ag'ts.
5	Paints, rubber, assorted colors	Pacific Rubber Paint Co.
2	Paper barrels (various sizes)	Flint, Peabody & Co.
2	Paper carpets and ware	Armes & Dallam.
9	Paper cuttings (framed)	Mrs. Ellis.
4	Passe-partouts and frames	Louis Dampf.
2	Paper, colored (printing and wrapping)	Pioneer Paper Mills, S. P. Taylor & Co.
4	Pastry Bureau	Wm. S. Moses.

Section.	Article.	Exhibitor.
6	Patented Inventions	Wiester & Co.
9	Patterns, "Bazaar" and "Royal Chart"	Mme. Morrow.
9	Patterns, Domestic	Domestic Sewing Machine Co.
9	Patterns, "Ladies' Guide"	Mrs. L. A. Ralph.
2	Pea Nuts, California	Conrad & Co.
9	Pen Drawing (see Penmanship)...	
9	Pen Drawing	John L. E. Firman.
9	Pencil Drawing	Miss Frankie Williams.
9	Pencil Drawing	Edward Newman.
9	Pencil Drawing	L. K. Mihill, Oakland.
9	Penmanship	D. S. Dow.
9	Penmanship	Golden Gate Academy.
9	Penmanship	Heald's Business College.
5	Perfumery, Hoyt's German Cologne	N. S. Coon.
5	Perfumery, Colgate & Co	J. G. Hodge & Co., Agents.
5	Perfumery	Newman & Bennett.
5	Perfumery	Redington & Co.
4	Phaetons, two seated, "canopy top"	H. M. Black & Co.
4	Phaeton, one seated, "canopy top"	Crego & Bowley.
4	Phaetons, one seated, "canopy top" (2)	Larkins & Co.
	Philosophical Apparatus	St. Ignatius College.

[Selections of Scientific Instruments exhibited by St. Ignatius College. This exhibit is a portion of the College Physical Apparatus used in teaching the Natural Sciences to the College Science Classes.]

N. B.—The apparatus marked thus *, was daily or occasionally exhibited in operation at the Pavilion by Rev. Father Joseph Neri, S. J., Professor of Natural Philosophy of the College.

MECHANICS—

Apparatus of ivory balls for showing the elasticity and impact of bodies.

Gradulated marble apparatus for elasticity and angle of incidence and reflection.

*Complete whirling table apparatus, for experiments on centrifugal force on solids and liquids.

Magdeburg adhesion plates, mounted for experiment in vacuo.

Apparatus for capillary tubes.

Endosmometer of Mr. Dutrochet.

Chemical balance, with platinum scales and weights 1-1000 of a grain.

HYDROSTATICS—

"Specific gravity balance" and accessories.

*Apparatus for illustrating the various kinds of pumps.
Apparatus of Haldat's, for the illustration of the laws of the equilibrium of fluids.
Model of Archimedes' Screw.
Venturi's apparatus for the flow of liquids.
Colladon's Fountain.
*Hero's Fountain.
Oersted's apparatus for the compression of liquids.
Mariotte's Bottle.
Apparatus illustrating the upward pressure of liquids.
*Fountain in vacuo.
Vases of Tantalus.
*Hydraulic Tourniquet.
*Intermittent fountain.
Apparatus of the "Cartesian Divers."
*Hydraulic Press, with double pump, capable of 3,000 pounds pressure.
Apparatus of Plateau for the equilibrium of liquid masses.
Apparatus for experiments on liquids in communicating vessels.
Nicholson's balance for specific gravity.
Spirit levels of various kinds.
Apparatus for showing the maximum density of water.
*Large working model of the hydraulic ram made of glass and brass.

PNEUMATICS—

*Air Pump, 5-inch cylinder and 14-inch stroke, with 16-inch plate for receiver.
Sets of glass bells of various sizes.
*Attachments of hand-glass, apple-corer, syphons in vacuo, balloons, etc.
Magdeburg hemispheres.
*Compression fountain of the capacity of two gallons.
Exhaustion pump for organic analysis.
*Resistance wheels.
Baroscope,
Apparatus for mercury shower in vacuo.
Glass globe for weighing air.
Sprengel's mercury apparatus for torricellian vacuum, in tubes or receivers.
Apparatus to illustrate the upward pressure of the atmosphere.
Double pump areometer.
Pneumatic syringe.
Mariotte's tube.
Mariotte's deep mercury cistern.
Gradulated bell-jars, with globes for experiments on gases.

ACOUSTICS—

A large model of the human ear, in sections.
Set of five tuning-forks and resonators of Helmholtz, for the five vowels.
*Syren of Cagniard Latour.
Lissajou's apparatus for the projection of the vibrations of tuning-forks.

Apparatus of Melde for the optical exhibition of the nodes and segments of vibrating chords.
Sets of tuning-forks of various sizes.
Apparatus for sounds in vacuo.
Apparatus for illustrating the laws of sound in organ-pipes and other wind instruments.
Apparatus for the studying of singing flames by means of a revolving mirror.
Apparatus of Konig for manometric flames.
*Syren of "Savart," to determine the number of vibrations corresponding to any musical note.
Glass bell mounted with ivory balls, to show nodes and segments in sounding bells.
Set of Chladni's vibrating plates for Chladni's acoustic figures.

HEAT—

Pyrometer, with bars of various metals and gradulated circle.
Ring pyrometer of Gravesande.
Apparatus of Guy Lussac for showing density of vapors.
*Rotating pyrometer for motion by heat.
Eolipile.
Eolipile mounted on wheels for experiments on reaction.
Apparatus of Boutigny, for experiments on the spheroidal state of liquids.
Large spherical mirrors for the reflection of heat.
Complete apparatus of Melloni's for experiments on radiant heat, consisting of lamps, screens, crystals, diaphragms, graduated circles, and other attachments for exact determinations.
Apparatus of Ingenhouz, showing the conductibility of solids.
Standard thermometers of various sizes.
Metallic thermometers of Berguet, arranged for electric currents.
*Apparatus of Tyndall for obtaining heat from friction.
Leslie's apparatus for freezing in vacuo.
*Apparatus of Carré for congealing large amounts of water by its own evaporation in vacuo.
*Franklin's pulse glasses.
Wollaston's cryophorus.
*Water hammer.
Thermoscopes of Leslie, and Rumford's.
Regnault's hygroscope, with aspirator.
Double aspirator for chemical hygrometer.
Carré's ice machine, by the evaporation of ammonia; large working model.
*Rider's new compression hot-air engine.
*Working model of a reversible steam engine, with boiler and all its appliances.
*One-horse power "Little Giant" steam engine and boiler, in action.
Model of a gridiron compensating pendulum.

Apparatus for showing the conductibility of liquids, with Dr. Howard's thermoscope.
Regnault's hypsometer for the determination of altitudes by ebullition of water.
New differential thermoscope of Matthiessen for comparison of liquids.
*Smaller steam engines of various kinds.
Hope's apparatus to determine the maximum density of water.
Apparatus for the maximum tension of vapors.
Guy Lussac's apparatus for the tension of vapors and gases to illustrate Dalton's laws.

MAGNETISM—

Large bar magnets for magnetization.
Smaller bar magnets for magnetic experiments.
"Inclination Compass." Apparatus with graduated circle for the exact determination of the dip of the needle in different places.
Native magnet or loadstone mounted with armature.
Declination compass.
Arago's apparatus to show the action of rotating copper plates on magnets.

FRICTIONAL ELECTRICITY—

Volta's condensing electroscope.
Nollet's globe and bell-jar.
Henley's universal discharger.
Ramsden's plate electrical machine.
Mounted conductors for the illustration of the laws of induction.
Holtz' electrical machine, 26-inch plate.
Carré's new dialectric machine.
Sir William Armstrong's hydro-electric machine.
*Batteries of eighteen Leyden jars.
Franklin's gauze bag.
*Electrical magic squares.
Electroscopes of various kinds.
Epinus' condenser, illustrating the laws of condensed electricity.
Kinnersley's electrical thermometer.
Electrical bells.
Electrical bells with Leyden jars.
Electrical pendulums.
Lane's electrometer and Leyden jars.
*Sparkling mattresses and panes.
*Sparkling Leyden jars and tubes.
*Volta's apparatus of the electrical hail-storm.
Coulomb's hollow sphere and insulated hemispheres.
Henley's quadrant electrometer.
Electrical whirl or vane.
Compound insulated discharger.
Leyden jar with movable coatings.
Ether cup for deflagrations by the electric spark.

Apparatus to show the mechanical effects of the electric discharge.
Volta's electric cannon.

GALVANISM—

*Mammoth magneto-electric machine; fifty-six magazines of magnets and and ninety-six induction coils, used in producing the light shown in the Pavilion, and revolved by a ten-horse power steam engine.
*Portable magneto-electric machine, equivalent to eight Bunsen cells, revolved by a one-horse power steam engine.
Plante's secondary battery.
*Circular electrical railroad and electro-magnetic locomotive.
*Set of Plucker's spectrum tubes, mounted for spectroscopic examination.
Faraday's complete apparatus for all experiments in dia-magnetism.
Small coil for the determination of the laws of induced currents.
Six-inch spark induction coil, by Ritchie of Boston.
*Large induction coil, by Ritchie of Boston, containing 151,000 feet of insulated copper wire, and capable of giving a spark of 20 inches in the air.
*Ruhmkorff's induction coil with automatic action.
*Bertin's commutator.
*Ruhmkorff's commutator.
Zamboni's dry pile and moving needle.
*Apparatus of De Moncel for showing the action of currents on magnets.
*Apparatus of Foucault for the conversion of magnetism into heat.
Large electro-magnet for illustrating laws of electro-magnetism.
Sir William Thomson's reflecting galvanometer, used with the Atlantic cable.
Ruhmkorff's lamp for the deflagration of metals and spectroscropic projections.
Volta's large eudiometer.
Faraday's open voltameter.
Closed voltameter for mixed gases.
Complete Ampère's apparatus for experiments in electro-dynamics, with accessories.
*Barlow's wheel.
*Apparatus of De La Rive to show the action of magnets on electrical currents in vacuo or rarified vapors.
*Apparatus for rotating large Geissler tubes.
*Smaller automatic rotator for small vacuum tubes.
*Large aurora tube.
Solenoids.
*Electro-motors of different kinds.
*Beam electro-motor of Bourbouze.
*Froment's rotary electro-motor, working pumps and sewing machines.
*Telegraphic instruments; American District, burglar alarms, electrical gongs and bells, and signaling apparatus of various kinds.

*An assortment of Bunsen, Grove and other galvanic batteries of various sizes and kinds.
Large mounted electro-magnet, capable of supporting 500 pounds.
*Electrical interrupter with three tuning-forks, by Helmholtz.
*Foucault's double mercury interrupter.
Vertical galvanometer for currents of tension.
Vertical galvanometer for thermo-electric currents.
*Gassiot's cascade in vacuo with uranium glass.
*Large assortment of rare and costly Geissler tubes, exhibiting all the phenomena of the electrical discharge in vacuo in various gases through phosphorescent and flourescent substances.
Schweigger's multiplier.

THERMO-ELECTRICITY—

Seebeck's element for thermo-electricity.
Nobili's galvanometer for thermo-electric currents.
*Clamond's new thermo-electric battery of 60 elements, equal to two Bunsen elements.
*Clamond's large thermo-electric battery of 260 elements, equal to eight Bunsen elements; worked by gas.
Melloni's thermo-electric pile.

OPTICS—

*Large lantern for the projection of optical phenomena by the electric light.
*Apparatus of the polyrama and dissolving views.
Large prism at variable angles for refracting liquids, and action of prisms.
Glass prisms at angles of 60°, 90°, etc.
Polyprism, or prism made of different refracting substances.
Large lens for showing phenomena of spherical aberration.
Apparatus for the demonstration of the laws of refraction and reflection, with various attachments.
Large model of human eye, in sections.
Heliostat of Mr. Duboscq.
Conical prism for circular spectra.
Compound microscope with accessories and mounted objects.
Dipleidoscope of Mr. Dent.
Mounted lenses of various kinds and focal distances.
Three large mirrors; plain, convex and concave.
Cylindrical lens with prism.
Two of Foucault's electric light regulators for optical projection, with large batteries.
Large electric light regulator of Serrin.
*Large electric light regulator, used in connection with the magneto-electric machine that lights the Pavilion.
Two prisms of equal angle, used for the recomposition of light.
Apparatus of Norremberg for the study of polarized light, with quartzes, selenites, glasses, and crystals of various kinds.

Polarizing microscope, with mounted objects.
Large saccharometer of Soleil, with all the appliances for the optical analysis of saccharine solutions.
Large plano-convex lens for illumination of large surfaces.
*Collection of chromatropes of various kinds.
Newton's disc for the composition of light.
Disc of Plateau.
Large Fresnel lens, in compartments, nearly three feet focus.
Phosphoroscope of Becquerel.
*System of lenses for optical projections.
Plane and double convex lens.
Apparatus of Malus for the polarization of light.
Apparatus of Duboscq for the projection of all the phenomena of polarized light.
Kaleidoscopes, with movable reflectors.
Large chemical spectroscope, with all the appliances for spectroscopic analyses.
Large diffraction apparatus, with thirty-five different pieces, for demonstration of all the laws and phenomena of the diffraction of light.
Achromatic lens, to exhibit achromatism.
Telescope of Rochon, for determining the distances of objects.
Two hollow prisms of bi-sulphide of carbon.
Large hollow lens for refracting liquids.
Prism for determining the indices of refraction of liquids.
Phenakistiscope, with transparent images arranged for projection.
Photo-electric solar microscope, with slides.
Wheatstone's photometer.
Photometer of Foucault.
Duboscq's horizontal lantern for optical projection.
Apparatus of seven mirrors for combination of colors.
Globe for nitrous fumes.
Globe for fumes of iodine for spectral analysis.
*Two magnesium lamps by Professor Norton.
Simple and compound apparatus for the calcium light and fusion of metals.
Direct vision spectroscope, with seven prisms.
Pocket spectroscope, with five prisms.
Apparatus of Stoke, with quartzes, prisms, and lens, for experiments on fluorescence.
Mounted single, double, and treble magnifying glasses, of various sizes and kinds.
*Spherical and parabolic mirrors for the electric light regulators.
Cubes and plates of uranium glass for experiments on phosphorescence and fluorescence.
Lactoscope of Donné.

METEOROLOGY—

Fortin's standard cistern barometer.

Siphon barometer of Guy Lussac.
Aneroid barometer.
Pluviometer of Babinet.
Hygrometer of Saussure.
Thermometers of various kinds and sizes for observation.
Chemical hygrometers.
Regnault's new silver hygrometer.
Maxima and minima thermometers.

Section.	Article.	Exhibitor.
9	Photocrome Copies	W. D. Dyer.
9	Photographs, collection of plain and colored	Bradley & Rulofson.
9	Photographs, collection of plain and colored	R. A. Marden.
9	Photographs, views in Central America, and others	E. J. Muybridge.
9	Photographs, colored	Mrs. M. Gillin.
9	Photographs, colored	Miss Lena Lawton.
9	Photographs, colored	Emily R. Eastman.
9	Photographs, colored	Mrs. Commary.
9	Photographs, colored	A. Hossack.
9	Photograph of Architectural Drawing (section view of Wade's Opera House)	S. C. Bugbee & Son.
9	Photographs, houses	Real Estate Associates, Wm. Hollis, President.
4	Pianos, "Hallet & Davis"	W. G. Badger.
4	Pianos	C. Boerner.
4	Pianos, "Hazelton"	Chas. S. Eaton.
4	Pianos, California made	C. R. Hall.
4	Pianos, "Weber"	Sherman & Hyde.
4	Pianos, "Guild"	Jas. S. Smith.
4	Pianos, California made	Jacob Zech.
8	Pickles	C. Jas. King of Wm. & Co.
9	Pictures, silvertype	Riegle & Wells.
9	Pictures, stereoscopic	Conklin & Co.
1	Picture Knobs, nails, etc	H. Marwedel.
1	Pipes, lap-welded pump columns	Dunham, Carrigan & Co.
1	Pipes, vitrified sewer	Gladding, McBean & Co.
1	Pipes, chimney, block tin	C. D. Paul.
1	Pipes, concrete, sewer and drain	Portland Concrete Sewer Pipe Co.
1	Pipes, double glazed vitrified ironstone sewer	Pacific Pottery, Sacramento, J. B. Owens, Agent.
1	Pipes, chimney elbows	Wm. Wehmoller.

Section.	Article.	Exhibitor.
4	Pipes, wooden	C. D. Wheat & Co.
1	Pistols, California make	A. Swingle.
6	Planer, Iron	Joshua Hendy.
6	Planer, wood	I. H. Small.
1	Planer Knives	Pacific Saw Co.
1	Plates for Boilers, homogeneous Steel, textile strength 70,000 lbs.	L. W. Beauman, Agent.
1	Plates, printing of all kinds	A. L. Bancroft & Co.
1	Plates, stereotype	Painter & Co.
1	Plates, stereotype	S. F. Chronicle Co.
1	Plated Ware	Pacific Jewelry Co.
1	Plated Ware	Pacific Gold and Silver Plating Works.
1	Plated Ware	R. F. Rochicioli.
1	Plated Ware	B. Nathan & Co.
1	Plated Ware	S. F. Plating Works.
1	Polishing and Fluting Iron	Wiester & Co.
6	Portable Steam Engine	M. C. Hawley & Co.
6	Portable Mill	Berringer & Co., San Jose.
6	Plows, gang	H. N. Dalton.
6	Plows, improved chilled	J. C. Bidwell.
6	Plows, gang and other	Frank Bros. & Co.
6	Plows, gang, "Deere" and others	M. C. Hawley & Co.
6	Plows, gang, "Myers" and others	Linforth, Kellogg & Co.
3	Plumes	Jacob Unna.
1	Plumbers' goods	Weed & Kingwell.
1	Plumbers' goods	W. T. Garratt.
4	Polisher, "Magic Knife"	Bushell.
1	Porcelain	B. Nathan & Co.
9	Porcelain, painted	E. Samisch.
4	Posts, Newels and Balusters	B. H. Freeman & Co.
4	Posts, Newels and Balusters	Sanborn & Byrne.
6	Power Pony	T. Altman, San Jose.
5	Powder, Giant, fuses, etc.	Giant Powder Co.
5	Powder, washing	Alta Soap Co.
5	Powder, washing	H. Fishbeck & Co.
5	Powder, washing	Standard Soap Co.
5	Powder, bronze and metal	Heuter Bros. & Co.
9	Preserved flowers	Mme. A. Gettz Lucas.
3	Preserved green turtle	Rodgers, Meyer & Co.
8	Preserves	C. Jas. King of Wm. & Co.
6	Press, "Perpetual" Hay	M. C. Hawley & Co.
9	"Press, Daily Fair," in operation	Dewey & Co.
9	Press, "Pacific Rural," 11 vols	Dewey & Co.
9	Press, "Scientific and Mining," 26 vols	Dewey & Co.
9	Press, "Fair Daily Press," 6 vols	Dewey & Co.

Section.	Article.	Exhibitor.
6	Presses, "Eclipse" Hay	Price Press Co.
5	Printing Inks and specimens	Shattuck & Fletcher.
1	Printing materials and presses	Painter & Co.
9	Printing, specimens of	A. L. Bancroft & Co.
9	Printing, specimens of	Crocker & Co.
9	Printing, specimens of	Shattuck & Fletcher.
2	Printing stamps	Wiester & Co.
2	Printing stamps	F. M. Truworthy.
1	Printers' Rollers	Shattuck & Fletcher.
6	Prismoidal Railway and Car, Sacramento Valley	Prismoidal Railway Car. Co.
1	Propellers, cast iron, for special service	W. W. Hanscom.
1	Propellers, cast iron	Ætna Iron Works.
6	Pulley Grip, Hallidie's patent	A. S. Hallidie.
1	Pump Columns, lap-welded	Dunham, Carrigan & Co.
6	Pump, automatic, by compressed air	J. E. Holloway.
6	Pump, "Excelsior"	Volney Cushing.
6	Pump, "Hooker's" Steam	W. T. Garratt.
6	Pump, "Hooker's" Hand	W. T. Garratt.
6	Pump, "Blake's" Steam	H. P. Gregory.
6	Pump, "Ramsey"	M. C. Hawley & Co.
6	Pump, hand	Holbrook, Merrill & Co.
6	Pump, "Kipp's" Steam	J. M. Keeler & Co.
6	Pump, Sluthour	J. M. Keeler & Co.
6	Pump, feed, water (Knowles' patent)	A. L. Fish & Co.
6	Pump, continuous acting	A. J. Smith.
6	Pump, "Balding's" double-acting force	Wiester & Co.
6	Pump, steam (4 sizes)	W. C. Wilcox & Co.
6	Pump, "Centennial" (model)	H. McGann.
6	Quartz Mill	Stephen Kendall.
6	Quartz Mill, 5-stamp	Prescott, Scott & Co.
1	Quicksilver Flasks	Dunham, Carrigan & Co.
1	Quicksilver Furnace	John Roach.
1	Quicksilver Retort	F. Gutzkow.
1	Rack, horse	J. M. Keeler & Co.
8	Raisins	Alden Fruit Preserving Co.
6	Rake, "Sulky"	Linforth, Kellogg & Co.
6	Rake, The "Randall"	Wiester & Co.
6	Railway, prismoidal	Prismoidal Railway & Car Co.
4	Rails and Balusters	B. H. Freeman & Co.
4	Rails and Balusters	Sanborn & Byrnes.

Section.	Article.	Exhibitor.
1	Ranges, stoves, etc	J. M. Bryan.
1	Ranges, stoves, etc	Holbrook, Merrill & Co.
1	Ranges, stoves, etc	Savage & Son.
6	Reaper	Frank Bros. & Co.
6	Reaper, "Buckeye"	M. C. Hawley & Co.
6	Reaper, "Rupell's"	Linforth, Kellogg & Co.
6	Reaper, "McCormick's"	McCormick & Co.
6	Reaper, "Kerby's"	D. N. Osborn & Co.
6	Reaper, "Wheeler's"	D. N. Osborn & Co.
4	Refrigerators	Armes & Dallam.
4	Refrigerators	E. K. Howes & Co.
1	Reflectors	Pacific Lamp and Reflector Co.
4	Relics of the ship "Niantic"	J. T. Jenning.
1	Riddles, foundry	A. S. Hallidie.
1	Rifles	A. Swingle.
3	Robes, carriage	Main & Winchester.
1	Rockingham Ware	Bergman Bros., Sacramento Pottery.
1	Rollers, printer's	Shattuck & Fletcher.
1	Rolls, chilled iron	Steiger & Kerr.
2	Rubber Paint	Pacific Rubber Paint Co.
3	Rugs, etc	C. M. Plum & Co.
3	Rugs, fancy	Mrs. Mourgeana.
3	Rugs, fancy	Mrs. E. Pritz.
3	Rugs, fancy	Mrs. N. F. Forsman.
3	Rugs, fancy	Miss Beauman.
3	Rugs, made from Angora Goat skins.	Angora Robe and Glove Co.
7	Rum, Jamaica	Chenery, Souther & Co.
4	Rustic Ware	T. Duffy.
4	Rustic Ware	P. Paulsen.
1	Rustic Ware, iron	J. M. Keeler & Co.
4	Rustic Ware	Stockton & Edwards.
2	Rye, White Oregon	"S. F. Journal of Commerce."
3	Saddlery	Main & Winchester.
1	Safes, fire and burglar proof, assortment of	Jonathan Kittredge.
1	Safety Valves	Weed & Kingwell.
1	Salamander Chimney Stacks	J. Browell.
3	Salmon, canned	Astoria Fishery, Columbia River.
3	Salmon, Columbia River	Cutting & Co.
3	Salmon, Columbia River	W. T. Coleman & Co.
3	Salmon, Columbia River	C. Adolphe Low & Co.
3	Salmon, Columbia River	Fitzpatrick, Davis & Co., of Fisherton, W. T.
8	Sauces	C. Jas. King of Wm. & Co.
6	Saw Gummers	Pacific Saw Co.

Section.	Article.	Exhibitors.
6	Saw Gummer and Filer, "Champion"	Wm. Gooding.
6	Saw Gummers	Potter & Bailey.
1	Saw Mandrels	Pacific Saw Co.
1	Saws	M. C. Hawley & Co.
1	Saws	Osborn & Alexander.
1	Saws	Pacific Saw Co.
1	Scale, Platform	O. R. Coe.
1	Scales, "Buffalo," all kinds	G. A. Raymond, Agent.
9	School Books	A. L. Bancroft & Co.
9	School Books	A. Roman & Co.
4	School Furniture	A. L. Bancroft & Co.
4	School Furniture	A. Roman & Co.
4	School Furniture	N. B. Childs.
4	School Furniture,	Gilbert & Moore.
2	Sea mosses, in various forms	Mrs. Albert G. Nye.
2	Seeds, California	R. J. Trumbull.
2	Seeds, California	B. F. Wellington.
1	Seltzer Water, Litton Springs	E. B. Smith & Co.
1	Separators (see Agricultural Implements).	
1	Sewer Pipes, etc., vitrified	Gladding, McBean & Co.
1	Sewer Pipes	Pacific Pottery, Sac , J. B. Owens, Ag't
1	Sewer Pipes, concrete	Portland Concrete Sewer Pipe Co.
6	Sewing Machine, the "Davis"	Mark Sheldon, Agent.
6	Sewing Machine, the "Domestic"	W. B. Fry, Agent.
6	Sewing Machine, the "Florence"	Samuel Hill, Agent.
6	Sewing Machine, the "Home"	C. P. Sykes, Agent.
6	Sewing Machine, the "Home Shuttle"	C. P. Sykes, Agent.
6	Sewing Machine, "Howe"	H. R. Ames, Agent.
6	Sewing Machine, the "New Wilson"	G. A. Norton, Agent.
6	Sewing Machine, the "Wheeler & Wilson"	W. T. Fonda, Agent.
6	Sewing Machine, the "Wilcox & Gibbs"	E. B. Cutler, Agent.
6	Sewing Machine, the "Singer."	R. H. Yates, Agent.
1	Sieves, of all kinds	A. S. Hallidie.
2	Shades, patent window	Hartshorn & McPhun.
6	Sharpener, patent harvest	Wiester & Co.
1	Shears	Chas. Otto.
6	Shingle Machine	F. A. Huntington.
6	Shingle Machine	I. H. Small.
4	Ship, model of	Peter Bulte.
4	Ship, model of	C. T. Peter.

Section.	Article.	Exhibitor.
4	Ship-yard, model of	J. J. Smith.
4	Shoemakers' Lasts	W. H. Wing & Co.
1	Shoe-nails, horse	Huntington, Hopkins & Co.
1	Shoes, horse	Paul Friedlander.
1	Shot	Selby Smelting and Lead Co.
9	Sign Painting	Swan & Brooke.
1	Signs, separate letter	H. Gosling, Agent.
6	Silk Braiding and Spooling Machine.	California Silk Manufacturing Co.
3	Silk Thread, Cord, etc.	California Silk Manufacturing Co.
1	Silver-plated Ware	S. F. Plating Works.
1	Silver-plated Ware	Pacific Gold and Silver Plating Works, Wm. Shepman, Agent.
9	Silvertype Pictures	Regel & Wells.
1	Silver Ware, solid	Koehler & Ritter.
1	Silver Ware, solid	Schulz & Fischer.
1	Silver Ware, solid	W. K. Vanderslice & Co.
1	Skate, C spring	Wiester & Co.
5	Slating Liquid	Gilbert & Moore.
4	Sleeve Buttons, wood	G. F. Atkinson.
4	Sleeve Buttons, wood	R. W. Brehm.
1	Sleeve Buttons, Abalone shell	R. W. Jackson.
1	Sleeve Buttons, separable	Pacific Jewelry Co.
5	Soap, fancy toilet	Alta Soap Co.
5	Soap, ammonia	Peter Burns.
5	Soap, bleaching	Hall & Wagner.
5	Soap, Colgate & Co.'s	J. G. Hodge & Co.
5	Soap, erasive	Edward Levy.
5	Soap, of all kinds	N. E. Soap Co., H. Fishbeck & Co.
5	Soap, of all kinds	Standard Soap Co.
1	Soap, rock	Ventura Rock Soap Co.
4	Spring Bed, "Crandall"	Clark & Rickoff.
4	Spring Bed, "Star"	J. Gray & Co.
4	Spring Mattress, "Champion"	A. Nachman.
1	Squirrel Cage, "Centennial Palace"	John West.
6	Stacker, steam	Frank Bros. & Co.
4	Staircase (twin) and Elevator	S. Gray.
4	Stair Newels and Balusters	B. H. Freeman & Co.
4	Stair Newels and Balusters	Sanborn & Byrne.
1	Stair Rods	E. H. Marwedel.
1	Stamps, printing	Wiester & Co.
1	Stands, cravat	A. S. Hallidie.
9	Stationery, of all kinds	Crocker & Co.
9	Stationery, of all kinds	A. L. Bancroft & Co.
9	Stationery, of all kinds	A. Roman & Co.
9	Statuary, six large statues in various parts of the building	P. Mezzara.

Section.	Article.	Exhibitor.
9	Statuary, marble	J. R. Meyers & Co.
9	Statuary and Statuettes	B. Nathan & Co.
9	Statuary, "Infancy," by Argenti Angelo, of Milan, Italy	W. C. Quinby.
9	Statuary, "Innocence," by F. Del Negrof, of Milan, Italy	W. C. Quinby.
9	Statuary, "Modesty," by Antonio Argenti	W. C. Quinby.
9	Statuary, "Prayer," by same	W. C. Quinby.
9	Statuary, "Unconsciousness," by F. Del Negrof	W. C. Quinby.
9	Statuary, "The Washing Girl of Milan," by Antonio Mollo, of Milan, Italy	W. C. Quinby.
9	Statuary, galvano-plaster	R. F. Rochicioli.
9	Statuettes, Rogers'	A. L. Bancroft & Co.
9	Statuettes, Rogers'	R. F. Rochicioli.
6	Steam Engines, hoisting	Hawkins & Cantrell.
6	Steam Engine, portable	M. C. Hawley & Co.
6	Steam Engine, working model	Herbert C. Robb.
6	Steam Engine, toy	Wiester & Co.
1	Steam Packing, asbestos	Salamander Felting Co.
1	Steam Packing, steatite	I. L. Merrell, Agent.
1	Steam Pipes and Water, all sizes	Dunham, Carrigan & Co.
6	Steam Stacker	Frank Bros. & Co.
1	Steatite Cement, etc	I. L. Merrell, Agent.
1	Steel Castings	J. C. Bidwell, Pittsburgh, Pa.
1	Stencil Plates	F. M. Truworthy.
4	Step-ladders	E. M. Benjamin.
4	Step-ladders	Stockton & Edwards.
9	Stereoscopic Pictures	Conklin & Co.
1	Stereotype Plates	S. F. "Chronicle" Co.
1	Stone, artificial	Pacific Artificial Stone Co., Oakland.
1	Stone, artificial	Snook Bros.
1	Stone, artificial	Eureka Stone Co.
1	Stones, Burr Mill	M. C. Hawley & Co.
1	Stones, Printers' Imposing	Painter & Co.
1	Stone Ware	Sacramento Pottery.
1	Stove, Cooley's Non-explosive Lamp	Benjamin Collins.
1	Stoves, Oil, The "Florence"	Samuel Hill, Agent.
1	Stoves, Oil, The "Monitor"	Tilden & Co.
1	Stoves, ranges, etc	J. M. Bryan.
1	Stoves, ranges, etc	Holbrook, Merrill & Co.
1	Stoves, ranges, etc	Savage & Son.

Section.	Article.	Exhibitor.
2	Sugar Beet	California Beet Sugar Co.
2	Sugar, Queensland	Robert Reed.
1	Surgical Instruments	Will & Finck.
1	Surveying Instruments	John Roach.
3	Swimming, bath materials	The Mermaid Salt Water Bathing Co.
4	Swings, centennial self-acting	Walter Hyde.
4	Swings, baby and jumpers	F. M. L. Peters.
4	Tables, Billiard	P. Liesenfeld.
4	Table, center (made with a knife)	Pierre Dutripon.
2	Table cloth (made in 1742)	Dr. A. J. Bettelheim.
4	Tables, fancy	B. Nathan & Co.
4	Tables, inlaid and carved	C. J. Larsen.
4	Tables, kitchen and dining, "Household Treasures"	C. H. Townsend.
4	Table-boards (ladies' lap)	C. J. Williams.
4	Table (ladies' favorite cutting, sewing and toilet)	John West.
1	Taps and Dies	Chas. Otto.
5	Tar Drops	H. Gosling, Agent.
6	Telegraphic Apparatus	California Electric Power Co.
6	Telegraphic Apparatus	Heald's Business College.
1	Terra Cotta Ware	Sacramento Pottery.
1	Tire Upsetter	Savage & Son.
6	Threshing Engines, "Mansfield"	Linforth, Kellogg & Co.
6	Threshing Machine, "Chicago Pitt's"	Linforth, Kellogg & Co.
1	Tin Ware	Holbrook, Merrill & Co.
5	Toilet Articles	Madame Mourgeanna.
5	Toilet Articles	Newman & Bennett.
4	Toilet Articles, (made from oil-cloth)	Mrs. A. F. Smith.
4	Toilet Tables	Chas. J. Williams.
1	Tools, carving	Chas. Otto.
1	Tools, edged (cleavers, axes and chisels)	W. F. Palmer.
1	Tools, blacksmiths'	Nelson & Doble.
1	Tools, edged, miscellaneous assortment, California manufactured	W. F. Palmer.
1	Tools, gaugers'	Will & Finck.
1	Tools, machinists'	C. F. Marwedel.
1	Tools, moulders'	C. F. Marwedel.
5	Tooth Powder	Ventura Rock Soap Co.
6	Track, and car model of one rail	D. J. James, of Visalia.
6	Track, and car model of one rail	Sacramento Valley Prismoidal Railway and Car Co.

Section.	Article.	Exhibitor.
1	Trays, centennial silver.	R. F. Rochicioli.
6	Treadle for saws, Barnes' Patent	Osborne & Alexander.
6	Treadle for sewing machines, "The Hall Treadle"	C. R. Sykes.
6	Treadle for sewing machines, "Ladies' Friend, Champion".	B. F. Pendleton.
3	Trunks, etc	H. Behrendt & Co.
1	Truss, elastic cork	Wm. Beman.
1	Tubes, boiler	Dunham, Carrigan & Co.
4	Turkish Kiosk	Dr. A. M. Loryea.
3	Turtle, green, preserved in cans	Juan A. Robinson & Co.
1	Twist drills	C. F. Marwedel & Co.
1	Twist drills	Charles Otto.
1	Type cases	Painter & Co.
1	Type borders of all kinds	Painter & Co.
6	Type Writer, Sholes & Gladden	A. L. Bancroft & Co.
4	Upholstery, fine	Bell, Guillixson & Co.
4	Upholstery, fine.	California Furniture Co.
4	Upholstery, fine.	Goodwin & Co.
4	Upholstery, fine.	Hoey & Taylor.
4	Upholstery, fine.	West Coast Furniture Co.
4	Umbrella, adjustable carriage	Waterhouse & Lester.
1	Urns, Iron.	Savage & Son.
1	Urns, Terra Cotta, etc	Bergman & Bros., Sacramento Pottery.
1	Valves, globe and water.	W. T. Garratt.
1	Valves, water and globe	Weed & Kingwell.
5	Varnishes, various	Hueter Bros. & Co.
1	Vases, cast iron	Savage & Son.
1	Vases, Terra Cotta, etc	Bergman & Bros., Sacramento Pottery.
1	Vault, bank.	Jonathan Kittridge.
8	Vegetables, dried, etc	Alden Fruit Preserving Co.
1	Ventilator, globe, for chimneys	C. D. Paul.
1	Ventilating Tiles, Lynch's	Thompson Brothers.
4	Velocipedes, three-wheel	Weister & Co.
5	Vials	San Francisco and Pacific Glass Works.
1	Vices, hand	Charles Otto.
1	Vices, hand	H. O. Reinhardt & F. B. Isaacs.
8	Vinegar, cider.	Sweetzer & DeLong.
4	Wagon, platform butcher	M. McCue.
4	Wagon, milk	J. R. Walton.
4	Wagons, "La Belle"	Frank Brothers & Co.
4	Wagons, "Schuttler"	M. C. Hawley.
4	Wagons, "Standard" platform spring.	J. M. Lawrence.

Section.	Article.	Exhibitor.
4	Wagons, "Fish Bros." various	Linforth, Kellogg & Co.
4	Wagon materials	L. W. Beauman, Agent.
4	Wagon tools, wheels and materials	Meeker, James & Co.
4	Wainscoating	Weister & Co.
1	Wash basins, marble	Thomas Day.
4	Washing machines, "The Complete Washer"	Weister & Co.
4	Washing machines, "The Boss"	Osborne & Alexander.
4	Washing machines, "The Champion"	Wm. Wainwright.
1	Water faucets	Weed & Kingwell.
1	Water filters, "The Champion"	Weister & Co.
1	Water pipes, all sizes	Dunham, Carrigan & Co.
6	Watch, or Gravitation Clock	E. E. Fisher.
9	Wax Flowers	Mrs. N. J. Healy.
9	Wax Flowers	Mrs. C. A. Flood.
9	Wax Flowers	Miss R. Alexander.
9	Wax Flowers	Mrs. A. G. Lucas.
9	Wax Flowers	Miss Annette Jones.
9	Wax Flowers	Mrs. M. V. Kendall.
1	Weathercocks	J. M. Keeler & Co.
2	Wheat, from Australia (1874)	D. L. Perkins, Sherman Island.
2	Wheat, from Canada, Chile, Oregon, etc.	L. Samuels, Portland, Oregon.
2	Wheat, from Fresno County	L. D. Chillson.
1	Wheat Screens	J. W. Quick.
1	Wheelbarrows, iron	Thomas McKibbin.
4	Wheels, Duval's patent	Duval & Sanborn.
4	Wheels, buggy and wagon	T. H. King & Co.
4	Wheels and Wheel Material	Meeker, James & Co.
7	Whisky, "Bonanza"	Dr. Renz.
7	Whisky, "Cedar Run"	Chenery, Souther & Co.
7	Whisky, "Old Style"	Lang & Co.
3	Whips, all kinds	Main & Winchester.
6	Windmill, patent	W. C. Nelson, Vallejo.
6	Windmill, the "Turbine"	A. H. Southwick.
6	Windmill, the "Centennial"	J. N. Rundle & Co.
6	Windmill, the "Economy"	W. I. Tustin.
6	Windmill, the "Regulator"	M. C. Hawley & Co.
6	Windmill, the "Centennial" (three-horse power)	E. O. Hunt.
4	Window Blind, patent	Pilbeam & Henderson.
4	Window Blind	Kelly & Dalton.
2	Window Curtains, Cornices, etc.	Hartshorn & McPhun.
7	Wine, "Golden"	Gustave Mahe.

Section.	Article.	Exhibitor.
7	Wines, consisting of Angelica, Claret, Hock, Muscat, Port, Reisling, Rose of Peru, Sherry, Tokay, White, and Zinfandel	Kohler, Frohling & Co.
7	Wines, consisting of Angelica, Claret, Mound Vineyard, Muscat, Port, Reisling, Sherry, White, and Zinfandel	Lachman & Jacobi.
7	Wines, consisting of Angelica, Gerke, Hock, Port, Sherry, White, etc. Champagnes: Eclipse, Muscatel, Private Cuvée, Sillery, etc.	I. Landsberger & Co.
7	Wines, California Port	H. Palmer.
7	Wines, California.	Lang & Co.
4	Wine Cask, of about 32,000 gallons capacity	Fulda Bros. & Co.
4	Wine Cask, of about 35,000 gallons capacity	D. Woerner.
1	Wire Goods, consisting of ornamental iron and galvanized wire railing; summer-houses; cemetery railing in iron and wire; flower-pot stands and conservatory stages; iron and wire tables; iron and wire chairs and stools; garden lounges and settees; improved rocking, arm, and folding chairs; tree-guards, various kinds; galvanized garden bordering; ornamental bouquet-stands; garden arches, of various kinds; wire trellises for vines; flower-pot brackets; plain and fancy hanging baskets; brass, iron, steel, and galvanized wire cloth of all grades, for fruit-drying, etc.; painted wire cloth for window-screens, meat-safes, dish-covers; weather strips; window-lifting rods and plates; wire rope and sash-cord of all kinds; sample piece of largest wire rope ever manufactured; samples of brass, copper, steel, iron, galvanized, and annealed wire; wire netting;	

Section.	Article.	Exhibitor.
	traps of all kinds; wire figures for the display of clothing; hat and bonnet tree stands	A. S. Hallidie.
1	Wire Goods, Summer houses, Tree guards, Wire Furniture, Bird Cages, Brackets, Household Articles, etc	Howard & Morse, N. Y., J. P. Bering, Agent.
4	Wood, bark of Big Trees	R. W. Brehm.
4	Wood, bark of Big Trees	S. F. Journal of Commerce.
9	Wood Engraving	J. Burgeon.
9	Wood Engraving, specimens of	August Kruger.
9	Wood Engraving, specimens of	G. G. White.
4	Wood, samples of woods of Pacific Coast	C. F. Atkinson.
4	Wood, samples of woods of Pacific Coast	R. W. Brehm.
4	Wood, samples of woods of Pacific Coast	West Coast Furniture Co.
4	Wood Turning, samples of	C. F. Atkinson.
4	Wood Turning, samples of	R. W. Brehm.
4	Wooden Ware, domestic, consisting in part of brooms, brushes, buckets, churns, ice-cream freezers, oil-paper carpetings, pails, paper, wringers, refrigerators, step-ladders, rope, twine, etc	Armes & Dallam.
4	Wooden Ware, consisting in part of barrels, butter-workers, moulds and chests, firkins, ice-cream freezers, "Eureka" refrigerators, step-ladders, etc	E. K. Howes & Co.
4	Wooden Pipe, Wickoff's patent	C. D. Wheat & Co.
3	Wool, scoured by bleaching soap	Hall & Wagner.
3	Wool, samples of various kinds	S. F. Journal of Commerce.
	Worsted work (see Embroidery and Rugs.)	
9	Worsted flower work	Miss R. Alexander.
9	Worsted flower work	Mrs. J. A. Cooksy.
9	Worsted flower work	Miss Annie Dahl.
9	Worsted flowers, various	Mrs. D. W. Rich.
9	Worsted flowers, various	Miss Anenette Jones.
9	Worsted ship, framed	Edward E. Jones.
9	Worsted vase	E. J. Wilcox.
9	Worsted, framed, "Death of Douglass"	Mrs. Borman.

Section.	Article.	Exhibitor.
9	Worsted picture, "Boar Hunt in Algiers"	Mrs. Alvina Mangenberg.
9	Worsted picture, "Night and Morning"	Mrs. Alvina Mangenberg.
9	Worsted picture, "Liberty" and two others	Mrs. Eliza Pritz, of Healdsburg.
9	Worsted pictures, various	Mrs. H. Stettin.
3	Worsted rug	Miss Beauman.
1	Wrenches, patent	H. O. Reinhart & F. B. Isaacs.
1	Wrenches, patent	Charles Otto.
5	Yeast powders, "Premium"	Bowen Bros.
5	Yeast powder, "Compressed"	Potrero Compressed Yeast Powder Co., G. Riedell, Agent.
1	Zinc monuments	Gray & Winslow.
1	Zinc, work of all kinds	George Hayes & Co.

CATALOGUE

OF THE

ART DEPARTMENT,

UNDER THE SUPERVISION OF THE SAN FRANCISCO ART ASSOCIATION.

	Title and Contributor.	Artist.
1.	Coast of Labrador	Wm. Bradford
	Dr. H. H. Toland.	
2.	Coffee House Scene	Ed. Sydel
	Fred'k Russ.	
3.	Freie Presse	F. Ortleib
	Col. E. E. Eyre.	
4.	The Torn Kite and Puzzled Grandfather	After Mayerheim
	W. Aug. Knapp.	
5.	Samson and Delilah	Chas. Nahl
	Chas. Nahl.	
6.	Grandmother's Pet	E. W. Perry
	J. R. Spring.	
7.	Cupid and Venus	Waterhouse (London)
	W. Aug. Knapp.	
8.	Grapes, Apricots and Plums	Morris Tettelbach
	Fred'k Russ.	
9.	California at the Vintage time	Designed and executed by Pietro Mezzara
	Pietro Mezzara.	
10.	Study from my window	Thos. Ross
	Thos. Ross.	
11.	Study from my window	Thos. Ross
	Thos. Ross.	
12.	Scene near Venice	Wm. Graham
	A. G. Hawes.	
13.	Scene near Venice	Wm. Graham
	A. G. Hawes.	
14.	Quail	K. E. Gerhardt
	K. E. Gerhardt.	
15.	Arrival of Emigrants in the Sacramento Valley	Wm. Hahn
	Rob't Sherwood.	
16.	Fruit	Ferd. Richardt
	Ferd. Richardt.	

	Title and Contributor.	Artist.
17.	The first Smoke Jabez Howes.	Wm. Hahn
18.	Golden Gate Ferd. Richardt.	Ferd. Richardt
19.	Portrait J. Barrington.	B. A. Fagioni
20.	Fandango Chas. Nahl.	Chas. Nahl
21.	California Wild Flowers Irving M. Scott.	Mrs. Wm. Keith
22.	Bull's Head Samuel M. Brookes.	Samuel M. Brookes
23.	Dogs Irving M. Scott.	De Voz
24.	Portrait Edward Bosqui.	E. Narjot
25.	Composition Wm. L. Marple.	Wm. L. Marple
26.	Twilight near Colusa W. Aug. Knapp.	Wm. L. Marple
27.	Fisherman's Rocks, San Pablo Bay W. Aug. Knapp.	Wm. L. Marple
28.	Solitude M. Straus.	M. Straus
29.	Sunset after a Gale James Hamilton.	James Hamilton
30.	Mountain Gorge (Wahsatch Mountains) Edwin Deakin	Edwin Deakin
31.	Mount St. Helena Virgil Williams.	Virgil Williams
32.	California Fruit Irving M. Scott.	Mrs. Wm. Keith
33.	Portrait, James McClure James Whartenby.	Toby Rosenthal
34.	The Heads, Golden Gate Edwin Deakin.	Edwin Deakin
35.	Spring Irving M. Scott.	Wm. Keith
36.	Summer Irving M. Scott.	Wm. Keith
37.	Autumn Irving M. Scott.	Wm. Keith
38.	Winter Irving M. Scott.	Wm. Keith
39.	Cattle Irving M. Scott.	Savery

	Title and Contributor.	Artist.
40.	Seal Rocks	R. D. Yelland
	Tiburcio Parrott.	
41.	Berkeley Creek (Sketch)	Edwin Deakin
	Edwin Deakin.	
42.	Cathedral Rocks (Sketch)	Thos. Ross
	Thos. Ross.	
43.	Wahsatch Mountains	Thos. Hill
	Thos. Hill.	
44.	Sketch	P. Loomis
	P. Loomis.	
45.	Moonlight on the Columbia River	P. Loomis
	P. Loomis.	
46.	Washington's Tomb	Ferd. Richardt
	Ferd. Richardt.	
47.	Evening on the Bueno ventura, S. A	Norton Bush
	Norton Bush.	
48.	Portrait, late Mayor Otis	S. W. Shaw
	Chamber of Commerce.	
49.	A Bulldog	Ferd. Richardt
	Ferd. Richardt.	
50.	Woodpath	Ferd. Richardt
	Ferd. Richardt.	
51.	The Orphans	A. de Succa
	A. de Succa.	
	Jane and Margaret, Princesses of Flanders, having just received the news of the death of their father, who was proclaimed Emperor of Constantinople during the wars of the Crusades.	
52.	The Fan Palm	Edwin Deakin
	Edwin Deakin.	
53.	Near San Francisco (sketch)	Thos. Ross
	Thos. Ross.	
54.	Morning on the Bueno ventura, S. A	Norton Bush
	Norton Bush.	
55.	Portrait, late Mayor Selby	S. W. Shaw
	S. W. Shaw.	
56.	Sketch	P. Loomis
	P. Loomis.	
57.	Sketch	P. Loomis
	P. Loomis.	
58.	Sketch	P. Loomis
	P. Loomis.	
59.	Donner Lake, from the Summit	Edwin Deakin
	Edwin Deakin.	
60.	Seal Rocks	Ferd. Richardt
	Ferd. Richardt.	

	Title and Contributor.	Artist.
61.	The Old Home	Harvey Young
	Harvey Young.	
62.	String of Pearls	E. Kraus
	Mrs. F. Castle.	
63.	Calis	W. H. Williamson
	Irving M. Scott.	
64.	Cliffs of Dover	W. H. Bloomer
	Irving M. Scott.	
65.	San Gabriel Mission	Wm. Hahn
	Robt. Sherwood.	
66.	Washington's Farm, Mount Vernon	Ferd. Richardt
	Ferd. Richardt.	
67.	The Disputed Pass	Jules Tavernier
	Tiburcio Parrott.	
68.	Roman Pilgrims	Virgil Williams
	J. R. Spring.	
69.	Portrait	Pebbles & Baldwin
	Pebbles & Baldwin.	
70.	Landscape	F. A. Butman
	Wm. McKenzie.	
71.	The Hunter's Spring	Jules Tavernier
	Tiburcio Parrott.	
72.	The Twins	B. A. Fagioni
	Tiburcio Parrott.	
73.	Portrait	Pebbles & Baldwin
	J. A. Ralston.	
74.	Portrait	F. M. Pebbles
	F. M. Pebbles.	
75.	Portrait	F. M. Pebbles
	F. M. Pebbles.	
76.	St. Cecilia of the Carlo Dolce	Urjlas
	D. J. Oliver.	
77.	Sunday Provisions	B. A. Fagioni
	Tiburcio Parrott.	
78.	Portrait	Lussier
	Lussier & Hill.	
79.	Portrait	Sully
	J. W. Burling.	
80.	Il Madrona	Virgil Williams
	Virgil Williams.	
81.	Portrait	Lussier & Hill
	Lussier & Hill.	
82.	Portrait	Addie L. Ballou
	Capt. W. E. Bushnell.	
83.	Helen Western	F. Arriola
	Miss Arriola.	

Title and Contributor. Artist.

84. Roman Peasant.....Virgil Williams
C. A. Byrne.

85. Head.....G. H. Burgess
G. H. Burgess.

86. Portrait.....Miss Claus
Miss Claus.

87. Portrait.....Miss Claus
Miss Claus.

88. San Joaquin River.....A. Bierstadt
J. R. Martin.

89. Studies in Oil by Pupils of the School of Design.

90. Fresco Paintings.....A. Frassi
A. Frassi.

91. Morning Glories.....H. Hall
A. K. Grim.

91½. Abadea (the Sultan's favorite).....B. A. Fagioni
B. A. Fagioni.

This is the artist's most ambitious and creditable effort, painted from a living model, dressed in costume furnished him by S. W. Laureys, of Wade's Opera House, late of Her Majesty's Theatre (London), which is sufficient guarantee of its truthfulness.

92. Basso Relievo, copy of Stork.....From Ancient Temple
W. A. Knapp.

93. St. Catherine of Alexandria.....Morani
D. J. Oliver.

94. Santa Cruz Mountains.....Wm. Keith
Wm. Keith.

95. A Revenge.....A. de Succa
A. de Succa.

Leoutio, Duke of Ottoyano and Stellina, poisoned on their wedding day. (History of Naples, by Mery).

96. St. Scholastica.....Morani
D. J. Oliver.

97. Basso Relievo, copy of Stork.....From Ancient Temple
W. A. Knapp.

98. Sunrise in the White Hills, Marin County.....W. L. Marple
W. A. Knapp.

99. Studies in Crayon.....Pupils of the School of Design

100. Paper Mill Creek.....W. B. Eary
W. B. Eary.

101. Portrait.....Miss Claus
J. T. White.

102. Stop Thief.....K. E. Gerhardt
K. E. Gerhardt.

103. Forsaken.....H. Duesbury
H. Duesbury.

	Title and Contributor.	Artist.
104.	The Valley of the Remac (Peru) Norton Bush.	Norton Bush
105.	Portrait Lussier & Hill.	Lussier & Hill
106.	Sketch W. B. Eary.	W. B. Eary
107.	Moonlight Scene in the Tropics H. Arriola.	H. Arriola
108.	Manor House (Denmark) F. Richardt.	F. Richardt
109.	Stockholm F. Richardt.	F. Richardt
110.	Tropical Scene W. A. Knapp.	N. Bush
111.	On the Sandhills Thos. Ross.	Thos. Ross
112.	Tropical Scene W. A. Knapp.	N. Bush
113.	Sunset, "Castle Maine" H. Arriola.	H. Arriola
114.	Git your Razor Ground N. W. Jones.	N. W. Jones
115.	Scene from Nature, in Mendocino Co., in Fall W. A. Knapp.	J. Harrington
116.	Portrait C. Browne.	C. Browne
117.	Portrait of a Child C. Nahl.	C. Nahl
118.	Foss (on the Geyser Road) Miss Rockwell.	Miss Rockwell
119.	Sketch W. B. Eary.	W. B. Eary
120.	Sketch W. B. Eary.	W. B. Eary
121.	Sketch W. B. Eary.	W. B. Eary
122.	Rustic Germany M. Straus.	M. Straus
123.	Niagara River F. Richardt.	F. Richardt
124.	New England Harvest, 1776 A. P. Hill.	A. P. Hill
125.	Portrait H. Duesbury.	H. Duesbury
126.	Portrait H. Duesbury.	H. Duesbury

	Title and Contributor.	Artist.
127.	Portrait	H. Duesbury
	H. Duesbury.	
128.	Portrait	H. Duesbury
	H. Duesbury.	
129.	Clipper Ship Three Brothers	W. A. Coulter
	W. A. Coulter.	
130.	A California Scene, 1876	A. P. Hill
	Geo. W. Hoag.	
131.	Falls of Niagara	Fred. Richardt
	W. Aug. Knapp.	
132.	Greek Pirates	Brock & Segelkow
	Brock & Segelkow.	
133.	Santa Cruz	W. B. Eary
	W. B. Eary.	
134.	Old Boat-House at Saucelito	N. W. Jones
	N. W. Jones.	
135.	Hicks' Valley	W. B. Eary
	W. B. Eary.	
136.	The Angel's Love	J. A. Harrington
	J. A. Harrington.	
137.	Scene in New Jersey	Geo. Hartwick
	W. Aug. Knapp.	
138.	The Flower Girl	B. Fagioni
	Tiburcio Parrott.	
139.	Portrait (P. A. Roach)	Addie L. Ballou
	Addie L. Ballou.	
140.	Port Madison, W. T.	Miss A. P. Campbell
	John Campbell.	
141.	Reading the Will	Chas. De Huva
	Col. Eyre.	
142.	Cañon, Glen, and Brook	Edwin Deakin
	W. Aug. Knapp.	
143.	Portrait	Miss Williams
	Miss Williams.	
144.	Beach of Scheveningen, Holland	J. Van Gorkum
	C. S. Steijlaars.	
145.	Grouse Shooting, Scotland	F. R. Welton
	Mr. Foster.	
147.	Normandy Horses	Emile Normand
	Irving M. Scott.	
148.	Canal Scene	M. Distree
	Fred'k Russ.	
149.	Portrait	S. W. Shaw
	A. F. Everett.	

	Title and Contributor.	Artist.
150.	Harvest, Sundown Irving M. Scott.	Betke
151.	Gypsies' Tent Irving M. Scott.	Van Der Venne
152.	On the Orwell B. J. Harnett.	B. J. Harnett
153.	Foggy Morning on the Bay of San Francisco W. Aug. Knapp.	W. L. Marple
154.	On the Cornish Coast B. J. Harnett.	B. J. Harnett
155.	Sheep Col. E. E. Eyre.	Frans Sebret
156.	Portrait Cameron.	Pebbles & Baldwin
157.	View on the Mediterranean Morris Schwab & Co.	Max Claus
158.	Little Emily's Home Col. J. Stewart.	B. J. Harnett
159.	Potomac River Mr. Foster.	H. W Kemper
160.	Portrait Miss Lizzie Williams.	Miss Lizzie Williams
161.	La Source Edward Bosqui.	Jules Tavernier
162.	Alsace Irving M. Scott.	H. Thompson
163.	Diana, Goddess of the Chase W. Aug. Knapp.	Conti (Rome)
164.	Hercules and Alceste Chas. Nahl.	Chas. Nahl
165.	Yorrick and the Grisette A. S. Hallidie.	Miss Reese
166.	Italian Minstrels A. K. Grim.	Gobel
167.	Road to Rome J. R. Spring.	Virgil Williams
168.	Portrait Mrs. Levet.	Geo. H. Burgess
169.	View of Niagara River, from the Third Sister Ferd. Richardt.	Ferd. Richardt
170.	River Seine Irving M. Scott.	G. Rossi
171.	The Dead Miner Jabez Howes.	C. Nahl

	Title and Contributor.	Artist.
172.	Old Home Jabez Howes.	Guilmard
173.	Artist's Studio (sketch) Edwin Deakin.	Edwin Deakin

WATER COLORS.

174.	Fairy Grotto C. S. Rouse.	C. S. Rouse
175.	The Young Artist Miss W. Dunlap.	Miss W. Dunlap
176.	Lyoner Apricots H. B. Russ.	Morris Tittlebach
177.	Short-horn Bull, Sonoma Henry Page & Co.	A. P. Hill
178.	Blue Plums H. B. Russ.	Morris Tittlebach
179.	Nasturtion Fred'k Russ.	F. Starke
180.	Sketch. Edwin Deakin.	Edwin Deakin
181.	Spring-time of Life, or the Age of Beauty W. A. Knapp.	Charles Chaplin
182.	Une Religeuse C. A. Byrne.	Miss Clayton
183.	Red and White Camelia H. B. Russ.	Morris Tittlebach
184.	Flag Lily Fred'k Russ.	F. Starke
185.	Red Plums H. B. Russ.	Morris Tittlebach
186.	Raspberries Fred'k Russ.	Morris Tittlebach
187.	Blackberries Fred'k Russ.	Morris Tittlebach

IN CENTER ROOM.

188.	Portrait of Mr. Codington Carl Browne.	Carl Browne
189.	Portrait R. R. Inspector.	O. Kaltschmidt
190.	California Tokay Grapes O. Kaltschmidt.	O. Kaltschmidt
191.	Portrait Mr. Neresheimer.	O. Kaltschmidt

	Title and Contributor.	Artist.
192.	California Tokay Grapes O. Kaltschmidt.	O. Kaltschmidt
193.	Portrait John D. Godeus.	E. Rode
194.	Woodward's Garden Joseph Lee.	Joseph Lee
195.	Crayon Portrait of Rignold as Henry V Carl Browne.	Carl Browne
196.	Plese H. Meyrick.	Chaplain
197.	Betchworth Avenue H. Meyrick.	C. Collins
198.	Daffodils H. Meyrick.	W. Pettigrew
199.	Wood Pigeon H. Meyrick.	A. D. Lucas
200.	The Coming Squall in the Mediterranean H. Meyrick.	De Stieger
201.	Pleasant Thought H. Meyrick.	L. C. Henley
201.	Ship "Young America" Capt. Combs.	
203.	Gen'l McComb Gen'l McComb.	C. M. Bowles
204.	Ogwen Valley, North Wales H. Meyrick.	Bartlett
205.	Alabama and Kearsarge J. B. Stetson.	
206.	On the English Coast J. B. Stetson.	
207.	Yosemite Valley J. B. Stetson.	
208.	Pot Pourri H. Meyrick.	
209.	Cattle H. Meyrick.	Dupont

ELEVENTH INDUSTRIAL EXHIBITION.

As no premiums were awarded this year, it was considered unnecessary to classify exhibits in the usual manner, but instead they were arranged into nine sections or divisions, as follows:

I.

Minerals, Mineral Products and Manufactures.

II.

Vegetable Products.

III.

Animal Products.

IV.

Manufactures from Wood, wholly or in part.

V.

Chemical and Pharmaceutical Manufactures.

VI.

Machinery.

VII

Wines and Vinous Products.

VIII.

Pomological and Horticultural.

IX.

Liberal and Fine Arts.

NOTICE TO EXHIBITORS.

The following request was handed or sent to each exhibitor, asking information regarding their exhibit:

Dear Sir—A full and complete report of the Eleventh Industrial Exhibition will be prepared and published as soon as possible.

In order to make it reliable and comprehensive, the management would ask you, as an exhibitor, to reply to the inclosed circular as soon as possible, and hand or send the same to J. H. Culver, the Secretary, who has the matter in charge.

A large number of the reports will be printed for gratuitous distribution, and it will be greatly to your advantage to give this immediate attention, as no extended notice of your exhibit can be given, unless the information is obtained officially from you or your agents.

In what year was your business commenced?

What are your manufactures?

What is the number of employees (average)?

What is the value of the raw material used per annum; when and what portion of it is produced here?

What is the value of the finished articles manufactured, per annum?

If a special exhibit, give the particulars of its composition, construction, or advantages claimed.

State, in a general way, anything in addition to the above that may be of interest; or, embody in an article *all* matters, or such as you wish known, pertaining to the above inquiries, or pertinent to the information desired.

Many complied with the request and their answers will be found under proper headings in the report. Those who paid no attention to the matter or gave no information regarding their exhibits, can have no just cause for complaint if no extended notice of their articles is given.

REPORT ON EXHIBITS.

DIVISION I.

Minerals, Mineral Productions and Manufactures.

No words in the English language have a wider scope than these, or apply to a greater variety of articles connected with the history of man and of civilization; in fact, a history of minerals might almost be said to be a history of civilization itself. Such, indeed, would be the story of the successive discoveries and utilization of copper, iron, silver and gold in ancient days, and the working and utilization of the coal deposits of the globe in our own day.

The first rude smithy was the cradle of civilization; the first smith, Tubal Cain, Vulcan, its founder.

What has led to more wars and revolutions, more colonizations, more founding of new empires, and the destruction of old ones—what led more to the discovery of the New World, and to the introduction of civilization to our own land, than the "*auri sacra fames*," the unholy hunger for gold? In fine, what has built up the manufacturing industries in the world of to-day, but the use of coal? No part of the earth, it may be safely said, is richer in mineral wealth, known and unknown, discovered and undiscovered, than the great mountain range, whose northern foot-hills are washed by the waters of the Icy Ocean, whose northern streams are fed with the snows of the Pole, whose middle region is land of torrid heat, and whose southern projection ends abruptly in the Southern Ocean by that strange land of fire and frost, Tierra del Fuego. Eight thousand miles in length, with hundreds and thousands of tributary chains and myriads of tributary valleys. It would seem to have been created the great mineral storehouse of the earth. Here on the Pacific Coast of the United States, a vast and wonderful future is open to us, in the prospect of the riches that have already met our gaze. We are as yet only on the threshold of the great domain, whose ample treasures shall, like those of the Land of Promise, gladden the hearts of the pioneers to come. Notwithstanding what appears to us their wonderful development, the mineral riches of the coast are as yet hardly known; and in view of their supreme importance, it argues sound wisdom and mature judgment in the governing Board of the Institute, to accord to them the first place—the honorable mention in

their various expositions. Up to the present, we are sorry to say, that their efforts to have a fair representation of the mineral wealth of this coast have not met with the success which the importance of the matter demands.

To speak of the gold and silver deposits of the Pacific Coast, of their immense riches, and of the vast sums already extracted, would be in some measure telling a twice-told tale; yet how many are there, even among our own people, who correctly appreciate their magnitude. To-day, after the exhaustion of over a quarter of a century, our placers and our bonanzas yield in round numbers $300,000 a day, or about $100,000,000 per annum, of which $43,000,000 is in silver, and $57,000,000 gold. In fact, we supply over half the world with silver and gold. Since 1848, we have flooded the earth with the precious metals, as the sun floods it with light, for in that space of time, our mines have produced $1,763,000,000, or $313,000,000 of silver and $1,450,000,000 of gold. That this is no exaggeration, may be proved by the annual reports of the Bureau of Statistics, which give the export value of gold and silver of domestic production for the past sixteen years at nearly $1,000,000,000 alone, and when we add the exports of the years from 1848 to 1860, and take into account the $10,000,000 annually used at home, in manufactures and the arts, the above figures will be easily reached, if not surpassed. Of this vast sum, more than three-fourths has gone abroad to swell the riches of England, Germany and France, and to fertilize the thousand channels of commerce all over the earth. We have, in fact, supplied enough of the precious metals to equal, when coined, one-third of the stock of gold and silver coin in all the nations of the world. The yield now is equal to one-third that of the total yield of gold, and of over one-half of the total yield of silver, and it is daily increasing. The possibilities of the future are even greater than have been those of the past. Not a tithe of the Sierras and the Rocky Mountains, or the placers of the adjoining valleys have been explored. It is only now that the extent and importance of the famous blue lead is being appreciated. The discoveries of the bonanza of Nevada, Panamint and other rich mines, are only matters of yesterday, and other greater bonanzas remain to dazzle the world with their riches. Utah is only beginning to know her treasures, and the same is true of Colorado. It is well known that Idaho and Montana contain numerous mines of great wealth, as yet unworked, while Arizona and New Mexico are practically unexplored.

It might be supposed that in a land which could well be claimed as the home of the precious metals themselves, a land where gold groweth, that gold and silversmiths would be numbered by the thousand, and that the manufacture of gold and silver into objects of luxury and art would be the prevailing industry. But it is not so; for in the most part the workmen of other lands reap the golden harvest, and we actually import, after being finished by the cunning of English, French and German artisans, no inconsiderable share of the gold and silver produced within our borders. Nevertheless, the manufacture of jewelry and silverware is an important one in this State. Twenty firms manufacture the former, and three firms the latter, exclusive of those engaged in silverplating. They employ 297 hands, and produce annually

goods worth $600,000 and $360,000 respectively. Of the former, but little has been placed on exhibition, but the latter is well represented. Silverware of the most beautiful description, exquisite finish, and chaste and artistic design, show what the gold and silversmiths of San Francisco can do. They reflect the greatest credit on the taste and skill of our local artists. There still exists abundance of room for the employment of labor, and the investment of capital, in the manufacture of articles of gold, as witness the great and constantly increasing value of the importation of watches, jewelry, silver and plated ware, and the growth of luxury and a taste for works of art and beauty among our rich men. Producers of gold and silver ought to have the world as purchasers of works in these metals.

Next to gold and silver on the Pacific Coast, though before them in value and usefulness, comes iron, in modern days the king of metals. Native iron is represented this year by specimens of ore from Clackamas County, Oregon, and from Shasta; and by bars of pig iron from the works at Oswego in the aforementioned county of our sister State. This iron is of splendid quality, equal to any ever imported to this market, and has always brought as high a price as the best English or American ever seen here. This being the Centennial year may have something to do with it, but we can conscientiously say that the iron resources of this coast are as inefficiently represented almost as it is possible to be. It may be that the attraction of our gold and silver mines account for it, but whatever may be the cause, the vast iron resources of this coast have, until a very recent period, been unexplored and almost unknown, and only now are they beginning to be appreciated. In Shasta and the northern districts of the State, the iron deposits are immense and almost inexhaustible. The want of coal proper for smelting may prove an obstacle in many cases, but in the locality previously mentioned there are found vast growths of willow which supply the finest charcoal, and charcoal iron is admittedly the best in the world. The famous Swedish iron is all made in this way. Transportation by the river is cheap and easy. Land can be had cheaply, and the ore instead of being purchased from the owner of the mine at a high price by the iron maker, can be had for the cost of mining. Those competent to judge, say that pig iron can be made in this State with a good profit at $23 to $25 per ton, and it is now cheaper than it has been for years, $30 per ton.

Why it is, with the facilities to hand, that the iron resources of this State and the coast are not better developed, is to us a mystery. There is ample room for the building up of a large and valuable industry. Last year over 28,000 tons of pig iron were imported into this city; the consumption was over 17,000 tons, and every succeeding year it will be greater. The larger proportion of the iron was British; the lesser, Eastern; a small proportion French, and only 1,069 made on the Pacific Coast, in Oregon. The quantity noticed here, would give employment to great deal of capital and labor if employed on this coast, but it is only a portion of that which we need. We import round, bar, railroad and sheet iron in much greater quantities than we do pig iron; hardware of all kinds, mostly Eastern, in still greater quantities. The total amount of iron used in the articles given, and the total amount annually imported is not less

than 50,000 tons, and will this year approach 60,000 tons, and with scrap and old iron added, 70,000 tons, worth, at the wholesale market price this year, nearly $2,000,000 in its unmanufactured state; in ordinary years $2,700,000. When manufactured it is worth at least $15,000,000. What a vast industrial army it would support if it were spent among hundreds of smelting works and factories and thousands of artisans at home, instead of helping to support Old and New England and Pennsylvania! But then we need not stop; when our farmers grew enough wheat to supply home consumption they did not look back, and now their consumption takes the smallest portion of their product. In this matter Oregon has been a long way ahead of California, and ten years ago started her first furnace fires at Oswego. Turning from the raw material, and directing our attention to the manufactured product, and a brighter prospect meets our gaze. Here a whole quarter of the city is occupied by foundries and machine shops, *et hoc genus omne*, in which 1,664 men are employed. The value of their labor being upwards of $4,000,000 annually. Hallidie's Mills use 10,000 tons of iron and 8,000 tons of coal annually. Wire and wire rope, were among some of the most interesting iron exhibits in the Pavilion, and worth $280,000 annually.

The exhibit of wire cloth and wire rope was both extensive and creditable. A short time since both these industries were carried on separately, but lately they have been consolidated under the management of Mr. Hallidie, the proprietor of the latter. The process of wire weaving was shown at the Fair, and was one of the most interesting exhibits. Among the wire ropes made for mining purposes, for shipping, etc., are some of the largest in the world; also, some of the smallest. Steel ropes three and one-half miles long have been woven in one piece. One 2,650 feet long has been in use in the Crown Point mine for two and a half years. The wire ropes used in the Clay Street Hill Railroad are further examples of the same kind. As a contrast to this, we may mention that some of no larger diameter than the one thirty-second part of an inch are also produced. About sixty men and boys are employed in this industry, the annual value of which is estimated at $500,000

The splendid exhibit of saws represents an industry worth $90,000, in which 160,000 pounds of steel is used. Steel tools consume 240,000 pounds annually.

The chain maker, in the machinery department, is the representative of what may be developed into a vast industry. The magnificent cutlery shown, which has been sold as far as London, and even in Birmingham and Sheffield, argues a prosperous future for that industry, the beginning of which has been so humble. The manufacture of Iron Pipe was once started in this city, but it was soon abandoned. And so on with other industries, of which iron or steel form the raw material. The industries represented and unrepresented are worth $5,500,000 yearly, and circumscribed as they are give employment to an army of 2,200 men.

Passing to coal, which, though geologically a vegetable product, is chemically speaking a mineral, we find that the mines of the coast are represented,

but in a modest enough way. Next to iron, coal is the great industrial factor of the age, and a land of coal mines is richer than a land of gold mines; and the land of coal will in time draw unto itself the metallic treasures of the land of gold. The Pacific Coast—the United States, using the term in its widest sense—possesses inexhaustible beds of coal. The Rocky Mountain coal field is probably the greatest in the world, covering, as it does, an area greater than Great Britain. The mines at Seattle are just in the infancy of their development; those at Coos Bay are only worked lightly, while the Mt. Diablo mines are by no means exhausted. The total annual product of the mines of the coast, including those of British Columbia, is 300,000 tons. It can be indefinitely extended. But none of the coal yet discovered on the Pacific Coast is equal to Lehigh, Cumberland or Australian for smelting, and English or Scotch for steam; and we import quite as much coal as is produced on the coast. Then our coals are too high priced—rates of tonnage, double and treble what they should be, being the main cause of it. We need further exploration to find a better mineral, and further agitation to obtain cheaper freights, before we can cease to be dependent upon others for such an indispensable article as coal.

The quicksilver flasks and retorts shown remind us of the production and shipment of one of our most valuable articles of commerce, and one of our oldest developed mining resources. Shipments have been made from the New Almaden mine since 1850, and since then the production has aggregated half a million flasks of 76½ lbs. each, 38,250,000 lbs., valued at $20,000,000. California is the great quicksilver producing country of the world, and this year will produce for the markets of the world 66,000 flasks, more than half the total production of the earth. The Coast Range, from Lake County to Santa Barbara, is full of this indispensable mineral, the status of which in the industrial scale is rising daily. Being such great producers, it would be naturally expected that we would make a showing in the manufacture of vermillion paint, and of the various drugs and chemicals of which it forms the basis; but our enterprise has not yet taken that direction.

The pig lead, and the manufacture of lead pipe, shot and shell, and the white lead of California production, are all of such superior quality as to indicate the importance of that mineral to the Pacific Coast. Formerly we used to import all our lead, and manufactures of it, from the East, now we have become one of the principal sources of supply to the Eastern manufacturers. Our lead resources are simply inexhaustible. Cerro Gordo and the Utah districts raise and ship 50,000 tons of argentiferous or silver-bearing galenas, some of which is refined and manufactured in our own city, while the major portion goes to the East or Swansea to be reduced. We need more reduction works and factories. There is no reason why we should import every year 1,200 tons of white and red lead, when we ship away such immense quantities of the raw material from which it is produced.

The splendid exhibit of manufactures in brass and mixed metals, bells, etc., and the less pretentious sample of copper ore, serve to remind us of an important though neglected branch of mining industry. Copper mining was

once the rage, as was also speculation in copper mine stock, and Copperopolis bid fair to become one of our greatest inland towns. From various causes not necessary to mention, the industry has declined; the total shipments of copper from this city by sea, in 15 years, from 1861 to 1875, has not exceeded 100,000 tons. The manufacture of thousands of articles in which copper forms so very important an alloy is, however, flourishing in the city. It is valued at half a million of dollars annually, and supports several large establishments and gives employment to an army of industrious workmen.

Though one of our most important mineral resources, Salt has not this year been represented at the Pavilion. In California it is simply obtained by the process of evaporating sea water. On the Bay of San Francisco, in Alameda County, there are about 20 different establishments, where 12,000 tons are made yearly. There is also a considerable quantity made on the Southern coast. In Nevada immense quantities are used in amalgamating, but the sources of supply are also immense. One deposit has fifty square miles, and there are whole mountains of it to be found. San Francisco formerly sent as much as 2,000 tons in one year to Virginia City, but the railroad tariff now discriminates against this city, and has killed off the trade. Some of the specimens of our bay salt give as high a per cent. as 98½ of chloride of sodium. This is as high as any in the world.

The borax refiners of this city make a good showing of the various preparations of that important mineral, borate of soda, so indispensable in the manufacture of iron, earthenware, and other industries. The extent of the deposits in this State at Clear Lake Slate Range, in Inyo County, and Esmeralda County, in Nevada, is unknown, and it is thought that they have been overestimated. The production last year was about 4,000 tons, of which 1,200 tons were used at home and the balance exported, principally to England. The locally refined article is sought all over the world where the iron or earthenware industries are carried on, and this has stimulated production, but with temporarily disastrous effects, as evidenced in the ruin of nearly all the original dabblers in the business, and in a fall in price from 25 or 28 cents three years ago to 6 or 10 cents to-day.

The illimitable soda resources of Nevada remind us that 6,000,000 pounds of various preparations of the mineral are imported from Great Britain, and large quantities of yeast powders, of which it forms an important element, from the Eastern States. During the past few years attempts have been made to utilize it, and now a very large quantity is annually produced. The manufacture of sal soda and bi-carbonate from it is carried on largely on this coast. The manufacture of yeast powders, so well represented, is valued at $60,000 annually.

Petroleum, or mineral oil, seems destined to form a very important addition to the productions of our State. The sample exhibited came from San Fernando and was, indeed, of excellent quality, but lately refined oil has been obtained as clear as the clearest water, and of quality equal to any in Pennsylvania. The consumption of the world is 28,000 barrels a day, while the production of Pennsylvania is only 20,000 barrels a day, leaving 8,000 barrels a day to be supplied by Southern California.

Sulphur should have been represented. It is a very important production and is found in great quantities in Nevada in a very pure state. It is also found largely in California as a by-product of quicksilver. It is brought in large quantities to this city, and is beginning to supersede that imported from abroad. Of the latter, ship loads used to be brought from Japan and elsewhere, for use in the chemical factories of the city. The present production of the coast is 4,000 tons a year, while the consumption is only 3,000 tons.

Native tin is not one of the metals on exhibition, though it should be. The mines belonging to the San Jacinto Company, when properly developed will be an important source of wealth to the coast. Tinned iron, to the extent of from 77,000 to 90,000 boxes a year, is imported from Great Britain, all of which should by-and-by give home employment. Though not using our tin or iron resources we make a very good showing of tinware, which employs several large firms, is largely exported, and is valued at about half a million dollars annually.

Chrome iron, some containing 60 to 75 per cent. of chrome, is found all over the State, and has been largely shipped to the East and Europe, of late years, where it is made into chrome yellows and greens, etc. One firm in the city ships largely of it. The deposit at Petaluma City is about worked out, but there is no limit to the supplies. The question why we cannot manufacture the colors ourselves and export them to other nations, is here pertinent.

Gypsum, so important in the manufacture of plaster, is absent from this year's Fair. Almost inexhaustible beds of the finest quality are found in Nevada, in the San Joaquin Valley, and on the Southern Coast. About 1,000 tons were utilized in the manufacture of plaster last year.

Did space justify we might dwell at length on the merits of the minerals found in the State. The slate deposits, the mines of alum and saltpeter, the asphaltum deposits, the celebrated soapstone of Ventura County, and many other mineral resources not mentioned here nor represented in the Pavilion. Enough, however, has been said to give an idea of the immense importance of the articles grouped together in this section, and of the almost illimitable deposits of some of them.

EXHIBITS IN DIVISION I.

Thomas Day. A large number of elegant gas chandeliers, clocks and bronzes, iron fountains, aquariums, statuary, and articles pertaining to the plumbing business. He commenced business in 1855, and the magnificent collection of articles taken from his general stock, and their artistic arrangement, show that he has kept pace with the advance and improvements of our

city. Although not strictly speaking a manufacturer, still in the fitting up of buildings with gas, water, etc., forty men are employed, and the annual amount of material used amounts to $50,000, of which $20,000 is produced here, consisting of sheet lead, lead pipe, water closet basins, etc. His sales amount to $400,000 per year. Part of the goods come from France and England, but the greater portion from the Eastern and Middle States.

It is to be hoped that the time is not far distant when the above class of imported articles will be manufactured in this State, as all the raw materials are here in abundance.

R. F. Rochicioli. Galvano-plaster work, metallic figures and moulds, basso relievos and ornamental work, etc. The commencement of this gentleman's business dates back to 1858, at the time when the industries of this coast first took their foothold amongst us; when by the settlement of the artist and the mechanic the prosperity of the commonwealth was assured.

The business that commenced with a small workshop and one employee, has increased to a spacious store and work rooms, with complete appliances for everything pertaining to the business, especially electrotyping for printing offices, gold and silver plating, and the embellishment of all articles by their requisite metal. Ten men are employed constantly, and the amount of raw material consumed is $4,000 annually, the most of which is produced here. The finished value of articles is $15,000 per year.

A special feature of the establishment is the coating with metal of all articles requiring protection from the weather; such as statuary, fountains, garden ornaments, etc.

Hermann & Co. Aquarium of a new and unique design; being divided by glass partitions into several communicating compartments.

Menzo Spring exhibits a case of artificial limbs. The superior quality and excellence of Mr. Spring's work is well-known in this city and State.

Salamander Felting Co., Pacific Branch. Asbestos, Steam Packing, Cement, Paint and Felting. This felting is a non-conducting covering for steam boilers, pipes, etc., its object being to prevent the radiation of heat and the condensation of steam.

The Pacific branch of this company commenced business here in 1874, and at present have twelve men employed, and consume about $9,000 worth of raw material annually, of which $8,000 is produced here on the Pacific Coast.

The Asbestos, and a large portion of the other ingredients, were formerly procured from the East, but at present they are procured in California. Some of the California Asbestos is of excellent quality, having a good, tough fibre, and being equal to any produced in the world.

This establishment turns out about $30,000 worth of work per annum, the most of it being job work; the company charging so much per square foot.

It is applied in a plastic form in three coats, each coat being one-half inch

thick. In order that the material may be durable, and not burn and fall off, the first coat is composed entirely of mineral substances, the fibre (which is used to bind it together) being Asbestos. This renders it absolutely fire-proof. The materials used for the two other coats are composed mainly of paper pulp and other suitable non-conducting substances, which not only make it very light and a non-conductor of heat, but render it exceedingly tough and elastic; so that it is impossible for it to jar off from the boiler or pipe to which it is applied.

I. L. Merrell. Asbestos as it comes from the mine. Roofing, Cement, Felting, Steatite, Soapstone and Fire brick. As at previous fairs, this gentleman made a large and interesting exhibit, and we regret that we have no data by which to give the amount of our native minerals, which he manufactures annually into Paint, Felting, etc.

The value of Steatite and soapstone as articles from which to make stoves and stove-backs has long been known, but it is only recently, comparatively, that its great value as a boiler covering or a protection to boilers and steam-pipes, from the effects of the surrounding atmosphere, has been known to the world. Being fire and water-proof, it can be used as a paint, as an oil-cloth, and for covering roofs. Merrell's steatite cloth roofing is valuable for protecting buildings from the devastations of fire and water. The steatite paint renders wood non-combustible, and applied to ships' bottoms prevents barnacles or fouling. The steatite is also valuable for luting purposes.

J. S. Eskins. Specimens of Asbestos Felting.

L. W. Beauman. Steel axles, bars, cast steel, and malleable iron articles; carriage materials, etc. (imported.)

Jonathan Kittredge, Phœnix Iron Works. Fire and burglar-proof safes and bank vaults. This was a fine display of a special branch of his large manufacturing establishment. His work is well known on this coast, and for strength, safety and finish will compare most favorably with any imported. They are essentially a home manufacture.

Iron doors and shutters, wrought iron girders and beams, fences and railings, prison cells, bridge and bolt work, are all in his line of business.

Mr. Kittredge established his business in November, 1849, and has kept pace with the wants of the State, and has demonstrated what persistent effort and good workmanship can accomplish. He employs about thirty hands, and runs three forges, increasing his force as the calls of the business warrant.

Will & Finck. Cutlery and bell-hanging materials, as exhibited by this firm, do them great credit. Their large and elegant glass case contained over fifty different specimens of cutlery, of which the style, finish and quality would be difficult to excel.

Their business was commenced in 1852, and has kept steadily increasing until the present. Twenty-five men are now employed, and their sales amount to sixty-five or seventy-five thousand dollars annually. The ivory used is principally obtained from Alaska. It is with pleasure we note the fact of this exhibit at the Centennial Exhibition, at Philadelphia, taking the first premium for cutlery, a verdict no doubt well deserved.

F. C. M. Fenn. Dried beef and vegetable cutter, a useful and convenient article for the household.

Weed & Kingwell display a general assortment of brass finishers' and founders' work, including several fine bells for church and steamboat. The line of brass goods exhibited by this firm for plumbers, gas and steam fitting, water and railroad companies, ship builders and others, was creditable in the highest degree. Their location in regard to light was unfavorable, and it is hoped will be remedied next year.

Charlrs Otto. A large and well selected assortment of hardware and mechanics' tools; also the American Spiral Spring Butt Hinge. Mr. Otto is also a manufacturer of small machinery and other articles, keeping five men employed, and consuming raw material to the amount $3,500 per annum. His business was commenced in 1854.

Bodo Wallman. Improved padlocks of his invention and manufacture. The extensive use and increasing sale of these locks is evidence of their superiority.

A. S. Hallidie. Wire goods in great variety for the horticulturist and the household; also wire rope and cordage wire of all kinds and wire weaving. The latter shown by a loom in operation day and evening.

The business, of which the elegant, useful and artistic samples on exhibition give some idea of the variety manufactured, was commenced in 1852; that is, the wire working business; the manufacture of wire rope was commenced in 1857, and wire drawing in 1871.

The wire rope manufactory of Mr. Hallidie has met a very great want on this coast, and has done much to facilitate mining operations. The ropes manufactured at these works are of all kinds and dimensions, and in quality are superior to any manufactured in England or the Eastern States, and cost the same. Mr. Hallidie has devoted close personal attention to the manufacture of wire ropes, and in their application to the many uses to which they are now adapted. The ropes used on the Comstock are largely of his make, and although he had considerably difficulty in introducing wire ropes there, they are now used almost exclusively by these mines, as also by the mines in the adjoining States and Territories. Much difficulty was met with at the outset in obtaining the materials suitable, and Mr. Hallidie made two trips East and to Europe before he overcame this difficulty, and an equal difficulty was encountered in obtaining skilled workmen, and nearly all the men now

employed in the departments have been instructed in their work by the proprietor himself, who is the son of the inventor of wire rope.

Like all successful businesses, it was only by dint of patient perseverance that this was established on this coast after years of loss and discouragement. Some of the largest ropes in use have been turned out here, and in completeness our San Francisco Wire Rope Works will compare favorably with others in any part of the world.

Most of the machinery is of Mr. Hallidie's design, and has been made here, and manufactures wire cords, ropes and cables of every size, from a picture cord of $\frac{1}{32}$ of an inch in diameter to round steel hoisting cable eight inches in circumference, or flat wire rope 12 inches wide by 1 inch thick. Steel ropes three and one-half miles long have been made here in one piece, and for durability, from statistics shown us, the average life of Mr. Hallidie's ropes is greater than the imported article. For instance, a steel rope made here was put to work on the Crown Point mine in Virginia City, August 1st, 1874; it is 2,650 feet long, three inches in diameter, made of steel wire; it has run continuously every day since, and is in good condition to-day. During that time it has hoisted 468,250 tons, and has not cost over fifty dollars for tar, etc.

The rope made for the Clay Street Hill Railroad Company, 7,000 feet long, shows an equally good result, and worked two and one-half years.

For transporting ores over mountainous districts the *Endless Rope Way* of Mr. Hallidie comes in admirable play, where economy in quantity of transportation has to be considered. The system has been successfully introduced in a great many places during the past four years, and gives very great satisfaction. The cost of carrying ores by this method is reduced to a minimum, and its capacity is very great.

The California Wire Works (Eckfeldt & Co.) has recently been purchased by him, as also has the stock and machinery of the Pacific Wire Manufacturing Company. The average number of employees in his extensive works is sixty, and several apprentices are constantly learning the trade. The amount of raw material used per annum is $100,000, of which $20,000 is produced here. The value of the finished products will amount to $250,000 per year.

National Wire and Lantern Works, Howard & Morse. Pacific Branch, J. P. Bering, Agent. Exhibits a large and varied assortment of wire goods, consisting in part of galvanized wire, summer houses, fences, tree guards, window screens, bird cages, articles for the florist and housekeeper, etc., all showing superior workmanship and design.

Reinhardt & Isaacs. Belt cutters; a useful tool, and, we believe, manufactured here.

J. T. Jennings. Several birds on a branch of a tree, all made of metal and very life-like.

Nelson & Doble. Blacksmiths' and miners' tools. This is an important branch of home manufacture. This firm employs a large number of men, as well as the aid of the most improved machinery. The raw material used is principally imported. Their business was established here in early days, and has been very successful.

McAfee, Spiers & Co. Boiler head made by Pennock & Co., of Coatsville, Penn. The piece was eight feet in diameter, three-eighths thick, and formed from one piece of metal.

Rhodes & Wason. Samples of borax and salt.

Smith Bros. Borax, in all its forms. This firm commenced business in 1873. Their average number of employees is twenty-five, and the production from their mines in Nevada, amount to the enormous sum of $250,000 per year. The introduction of what is termed the package trade was inaugurated by them in July last, and the first exhibit of borax in that form was that on exhibition at the present fair. The large deposit owned by these gentlemen, and their prosecution of the business, has caused the entire suppression of importing that article to this coast

They are now putting it up in a form and at a price that will commend itself to every person for general use for household, laundry and toilet purposes. Its properties as a cleaning, purifying and curative agent are well known. It is specially obnoxious to all kinds of vermin, and is a good disinfectant.

It is the intention of the firm to immediately introduce the article throughout the United States. They are deserving of great praise for their endeavor to stimulate the use in the household of so valuable an article, whose great virtues have heretofore been but little known, except in art and science.

We hope their success will be such as the virtues of the article known as "Smith Bros.' Warranted Chemically Pure Pulverized Borax" merit.

E. K. Stevenot & Co. Exhibit some beautiful specimens of telluride of silver and gold, silver and copper ore, bricks of refined silver and refined borax, tastefully shown in the shape of two neatly made bird cages. This firm was the first to commence the refining of borax on this coast.

Painter & Co. Printing presses, type, and a general assortment of printers' furniture and materials. This was a very fine display of everything pertaining to the Printers' Art. It was their intention to exhibit during the Fair the process of casting type (of which they are large manufacturers), but owing to the lack of convenience for melting metal, could not do as they desired. The house of Painter & Co., founded in 1850, is now firmly established. There are seventy-five hands employed by the firm in the various processes connected with the production of type, and as the business grows more prosperous, new ones are constantly being added. The metal used in the manufacture of the type is of home production, and this enables the proprietors to produce a much better quality of goods than would otherwise be

possible. Besides the goods produced by themselves, they have the agency of all the well known presses made by Gordon, Hoe, and other makers. The reputation of their foundry, the oldest in this part of the country, for hard, tough, and durable metal, and general accuracy, has been undisputed; but if parties desire extra hard metal type, they will manufacture it to order for them, as it costs less to make, but it is very brittle and porous, and the hair lines are easily broken off.

John West. A wire squirrel cage, termed by him a centennial palace, though the occupant would probably consider it a prison.

Tuebner & Hoffman. Metallic show cases. These cases were of neat designs, beautifully silver plated, and fine specimens of home industry.

J. C. Bidwell, Pittsburgh Plow Works., Penn. Exhibits plows, agricultural steel and iron castings. This concern employs 130 men and turns out annually $900,000 worth of materials. A specialty exhibited here is their chilled metal for plow mould boards and land sides, uneqalled in hardness and strength. It is claimed that it will serve in any kind of soil and wear longer than any other metal ever put on a plow. The shares are of cast cast steel and can be hammered, drawn out, and tempered to any desired hardness, thus combining very desirable qualities in a plow. It is to be regretted that there is no manufactory on this coast of cast cast steel and malleable iron articles. The large amount expended each year in importations of such articles should induce some of our capitalists to invest in what is sure to prove a paying business.

Steiger & Kerr, "Occidental Foundry." Exhibit one of Hepburn's amalgamators, tuyere irons, grate bars, forge moulds, iron moulds, iron castings, a patent lubricating car box, and a pair of eight-inch chilled-iron rolls. The latter are remarkable for their uniform quality, showing from end to end a perfectly smooth surface.

Dunham, Carrigan & Co. Display water and gas pipe and pump columns of all sizes, from one-quarter inch to fifteen inches in diameter. While most of the gas and water pipe manufactured and shipped to this coast is known among dealers as butt-welded, the pipe exhibited by this firm is known as lap-welded pipe. The advantage of this style of pipe is its equal and increased strength throughout all parts. It is not full of ridges on the inside, as in the case of the butt-welded pipe. The interior will be found as perfectly smooth as the exterior, thereby insuring less friction and greater discharge.

The lap-welded pump column is fast becoming celebrated among mining men as something long needed, especially in deep mining, both in this State, Nevada, and Utah. Its advantages over the old-fashioned riveted pump column are numerous, and being perfectly smooth on its inside, it will discharge about one-third more water with the same or less power than a riveted column, which is accounted for by the great obstruction of the rivet heads and seams

in the latter style of column; moreover, the constant jarring will, in course of time, cause rivets to wear and break and, as a consequence, a large amount of water which should be raised to the surface will be pouring out of the seams and falling back into the mine. The lap-welded column being equally solid and strong throughout its entire circumference, entirely obviates this trouble, as no water can come through its sides until the pipe itself is worn out.

They have also samples of welded water pipe, ranging from three to fifteen inches in diameter, especially adapted for public and private water works, and for hydraulic mining. This pipe is coated, both inside and outside, with an indestructible patent enamel, which effectually protects the iron from all action of rust, as well as destruction caused by the alkali and mineral which so impregnates the majority of the water in this State.

This firm also exhibits samples of lap-welded quicksilver flasks, an entirely new article in American manufactures, which, in appearance and finish, are far superior to the ones now in general use. They assure us that their flasks are tested under a pressure of one thousand pounds per square inch, and they guarantee every flask to be perfect. As quicksilver forms one of our great mining products on this coast, these flasks are well worthy the inspection of all who are interested in this branch of industry.

Low & Chartry, City Iron Works. Cast iron statuary and cast iron ornamental work. The head of a horse exhibited, shows a high degree of moulder's skill.

Pendergast & Smith, Ætna Iron Works. Exhibit a variety of useful and ornamental cast iron work. Some iron frames for pianos being particularly noticeable for their smooth appearance. There were also heaters for laundry purposes, moulds for bullion or lead bars, slag pots, propeller blades, grate bars and other articles, all showing a thorough knowledge of what is necessary to produce "good castings."

James E. Gordon, Pacific Chain Works. Chain furnace and forge. This interesting exhibit was always surrounded by an interested crowd watching the chain as "link by link it grew" under the skillful blows of the smith's strong arm. These works were established in 1874, and the number of employees vary from five to fifteen, according to the work on hand. About $5,000 worth of iron is used annually; the same being rolled especially for their use by the Pacific Rolling Mills of this city. The value of the chain manufactured per year is $7,000. Their chain is all hand made and warranted. Mr. Gordon had also a fine display of the "Beaver" brand of files, and other hardware.

Yates & Co. Chandeliers, lamps and lamp fixtures for burning coal oil.

P. D. Paul. Globe ventilator and chimney caps. This is a new and improved article for the above use, and patented in 1876. It is claimed that it will operate at any angle, and in any position, and if used as a chimney cap it is only required to be raised high enough to give proper proportion to the

structure, regardless of walls or contiguous buildings. A current of air from any direction cannot but produce a draught. In the absence of a chimney a stovepipe may be passed through the building, a cap placed on the end, and a good draught will be secured. It is especially adapted for purposes of ventilation, and is storm proof.

J. Browell. Salamander chimney stacks. This improvement in stacks consists in constructing them of sections of fire clay, earthenware or artificial stone, and surrounding the same with a metallic tube larger than the stack or chimney in order to provide the necessary ventilation for keeping the inner pipe cool, and for furnishing warm air to the rooms of the house. There is also a novel arrangement for binding the sections together in their upright positions, and for fixing and protecting the joints where they meet.

B. Nathan & Co. Large and extensive exhibit of bronzes, china and porcelain ware, statuary, plated ware, glassware, and articles of taste and ornamentation. One of the most attractive places in the Exhibition.

Hakes & Carroll. Stockwell's self-lighting burner. This is done by the explosion of a small portion of fulminate powder contained in a strip of prepared paper coiled in the mechanism that operates the hammer. It can be easily applied to any burner, is cheap and effective.

John Roach. Exhibited a case of optical and philosophical instruments, barometers and thermometers for general use; also gauges and thermometers made specially for sugar pans, solar compasses, levels, transits and compasses for miners' use, and many other articles appertaining to this branch of trade. Mr. Roach commenced the optical business in New York City in 1827. In 1855 he came to this city, where he has continuously prosecuted the same business until the present time. His instruments have a reputation throughout this State that he may well be proud of, for in many respects they are superior to, and in all points will compare most favorably with others, no matter where made. Each instrument has some peculiarity and improvement, the result of a lifetime of study and close application to an intricate business, which has made Mr. Roach verily a master of his art.

There are on exhibition plain transits with single vernier reading to single minutes, with large compass needle well suited for land surveying. These appear at first glance to be short centered instruments, but on examination will prove to have longer centers and more substantial sockets than those made East. The two vernier instruments are made in a similar manner.

A polar transit for public land surveying has a revolving telescope, a compass circle, and the arcs so divided that triangulation may be performed with this as well as any angular instrument, while the solar part is of a large radius, insuring great accuracy.

A miner's transit, having an extra telescope on the end of the horizontal axis, admits of any angle being taken, as up or down a shaft, and a prismatic eyepiece allows of an easy position of the observer. There is besides an 8-inch instrument reading to thirty seconds.

The average number of men employed by him is four; the amount of raw material used per annum is about $3,000, and the value of the manufactures, from eighteen to twenty thousand.

He also exhiblts a working model of an improved quicksilver furnace, in which are combined the best parts of three patents issued in 1866 and 1868 to himself and Messrs. Coult & Formhals. One of the principal improvements is the use of a fan, pump or blower, for creating a draught, which it is safe to say was the first change or improvement made in the treatment of quicksilver ores for the past one hundred years. The principle of forcing or drawing the air through furnaces used for the reduction of cinnabar ores by mechanical means is now in general use. For the use and benefit of his invention, we believe he has never received any remuneration whatever. The model exhibited was capable of treating or reducing 25 pounds of ore at once.

W. T. Garratt. Brass Goods. This was one of the largest and finest exhibits of brass home manufactured goods in the Exhibition. The lighter goods were tastefully arranged in a large show case against the wall, and the heavier ones on the floor in front. The list includes gongs, steam whistles, steam gauges, lubricators, oil cups, steam cocks and valves, hydraulic nozzles, pipes and fittings, Ingot copper and Garratt metal, church and steamboat bells, plumbers' goods, steam fittings, and an endless variety of other manufactured articles; also, a large display of "Hooker's Steam Pumps," which will be noticed in Section 6.

This business, so prominently displayed, was commenced by Mr. Garratt and brother (since deceased) in 1850, and has always ranked as the largest brass manufacturing establishment on this coast. About one hundred men are constantly employed, annually producing finished work to the amount of many thousands of dollars. Much of the raw material used in the business is produced on this coast, thus saving to the State a large amount of money that would otherwise be expended in importations.

J. M. Bryan. Stoves, ranges, Japanned and copper ware. This was an attractive exhibit to housekeepers, and no doubt the time and expense attending the display have been well repaid by the sale of articles selected during the fair.

Holbrook, Merrill & Co. Exhibited a large and extensive assortment of portable ranges, cooking, office and parlor stoves; tin, copper, Japanned ware; stove furniture and fixtures. The tin, copper, and Japanned ware were manufactured at their extensive establishment in this city, where, by the aid of power and the most improved drop presses and machinery, they are turning out thin metal work of a quality equal to any made in the world.

Wm. Wehmoller. Corrugated stove-pipe elbows. These elbows, which have almost superseded the old style of right angled ones, are manufactured here. The exhibit showed pipe made from iron and zinc, turned at every conceivable angle, with no danger of breaking apart. Many persons have

probably thought, while looking at them, of "bitter experiences" with stove-pipes, that might have been avoided had the elbows been corrugated.

Pacific Saw Co. This fine display of home manufactured articles consisted of circular, band, cross-cut, hand, meat, jig, and ice saws, of every description; reaper sections, planer and curriers' knives; saw mandrels, gummers, swages, and many other articles made from steel. It occupied a large wall space, the specimens being arranged in a very neat and tasteful manner. For variety and value it was equal to any exhibit in the pavilion. The figures 1876, stars, crosses, vines, and the letters of the company's name were formed of saws, knives and reaper sections, most artistically executed. Mr. N. W. Spaulding is the inventor of the patent movable teeth in the large circular saws that were so prominent in the exhibit.

The art of forging and tempering large circular and long muley saws is one possessed by but few workmen, and it is only by securing the most skillful of these and the use of improved machinery that this company have been enabled to command and retain the patronage of the mill owners of this coast. The strong competition and low prices ruling the lumber business has compelled the mills to adopt the best machinery and saws the world afforded, and this trade has flowed into this company's hands. The immense size of the logs produced by our redwood forests renders very large circulars and long muley saws necessary for economically working them into lumber. One mill on the Mendocino coast has a muley saw 16 feet long, though 12 feet is the common length in most mills for splitting the logs into slabs for the circular, which is usually five feet in diameter. Such a circular costs about $400.

W. F. Palmer. Had the only large and comprehensive exhibit of edge tools at the Pavilion, which were all the more noticeable as being made here and by the hands of Mr. Palmer individually, who not only shows the finished article but also the same tools "in the rough," from the mass in iron and steel up to the finished work. Every tool of Mr. Palmer's make is warranted to cut in any kind of wood, and are a sufficient evidence that he is a superior workman, for in these days most men learn to make one or two articles in any particular business and are kept at that all their lives, so that men who understand their whole business are very scarce. Two years ago Mr. Palmer came here an entire stranger and started the edge tool business in company with another gentleman, an old Californian, who died soon after the shop was started, leaving Mr. Palmer to struggle on the best he could or return East. He has remained with us, and though he met with much opposition in various ways, and times have been dull for the past year, he has succeeded in placing his tools in the hands of a majority of the ship carpenters of this city and coast, and many of the mill-wrights and house carpenters, which is a sufficient evidence of their good quality. As Mr. Palmer is the only regular edge-tool maker on this coast he is certainly a man very much needed here, as one to whom men can go and get their tools made or repaired to their particular fancy. We trust he has laid the foundation of a lucrative business and wish

him all success. The superiority of his goods has been recognized by the award of a gold medal at the Tenth Exhibition of the Mechanics' Institute, the State Fair of 1876, and a medal at the World's Exposition at Philadelphia.

C. Allison. Socket for holding drills. This is a new and apparently useful invention for the purposes designed.

Giant Powder Co. Exhibits a number of hand drills of various diameters, suitable for the different sized cartridges of their powder.

Grant & Co. Elaine oil, claimed to be superior to other brands of coal oil. A cask with the heads of plate glass and lying level with the eye, served to show its clearness and purity.

Savage & Son, Empire Foundry. Had a large and varied assortment of articles manufactured at their extensive establishment. Among the list were several ranges (termed the Occident), which for finish, elegant appearance, and economical burning properties will compare most favorably with any imported. Also, garden vases, grate fronts, fire grates, blacksmith's forge moulds, tire upsetters, and a peculiar heat radiator to go with mantels. Soil pipe and burial caskets are made a specialty by them, and are worthy of commendation.

San Francisco Chronicle Co. Gave a very instructive exhibit of the art of printing, by a display of the stereotype plates of their paper in the various stages of preparation. But few of the many have any idea of the various processes that almost every product is subjected to before it is finished, therefore such exhibits are specially praiseworthy, and we think whenever practicable should be made.

Alfred Swingle. Breech-loading fire-arms. This case of guns and pistols are of his invention and manufacture. The cartridges are contained in a tube in the breech and stock and are projected in the usual way. The barrel is arranged to slide longitudinally and provide an opening between it and the branch block into which the cartridge is elevated by a saddle. This saddle is operated by the movement of the barrel so that when the barrel is drawn back against the breech-block it forces the saddle into the line with the cartridge tube. Its forward movement allows the saddle to receive a cartridge and simultaneously elevates it in line with the bore of the barrel. The movement of the barrel is accomplished by the hands, one of which operates the guard and locking case to free the barrel, while an extension of the forward hand slides the barrel away from the breech block. A counter movement of the forward hand closes the opening, at the same time forcing the cartridge into the bore. The locking device for securing the barrel against the breech blocks is extremely simple and effective, and can be readily understood from the drawing or an examination of the gun at the Fair. A very important and novel feature is the provision of means by which the gun can instantaneously be converted from an automatic breech loading repeater to a hand loading

breech loader, and at the same time retain a reserve of cartridges in the breech, which can immediately be brought in action when desired. The gun has several other important improvements, such as a safety hammer, a gas joint, etc. He also exhibits a simple and effective patent clutch for pulleys.

J. M. Keeler & Co. Made a fine and attractive exhibit of cast iron ornamental goods; such as fountains, statuary, vases, figures, etc., for conservatories, public places and grounds. We would make special mention of their stable fixtures; such as cast iron stall guards, mangers and racks. Also harness hooks, hitching posts and rings, saddle brackets, weather vanes, etc. The stall that was fitted up complete no doubt attracted many who will prove good customers. They also exhibited an engine and pumps which will be noticed in Section 6.

J. H. Gates. Had six of Mathew's patent soda fountains on exhibition and in operation.

Newmann & Bennett. Exhibited one of Chas. Lippincott & Co's large marble and silver plated soda fountains, of which they are the agents here.

J. W. Quick. Made a fine showing of metal screens of various kinds, all his own manufacture. Among them were those made specially for malt, grain, barley, furnace, and for quartz and smut mills. A meritorious exhibit of California manufactures.

George Hayes & Co. Galvanized iron cornices and window caps, stamped zinc work, ventilators and gutters. This firm commenced their manufactures here in 1873, although their principal business is in New York, where they started in 1869. Their exhibit of skylights shows a combination of forms, in which any moisture from without, or condensation from within, is caught by a series of conducting gutters, and conveyed to the outside of the building, thus assuring against any dripping of water, while the material used, and the lightness thereof, enables them to build glazed structures of great strength, durability and beauty, and which are also fire-proof. The exhibit of dormer windows, etc., exclusive of skylights, show the artistic use of the hammer in producing ornamental architectural work in metals, being analagous to the well-known repoussè work executed in Europe. Our city has now attained such dimensions, that one of the important considerations in buildings should be to render them as near fire-proof as possible. The heavy wooden cornices and ornamental work so generally used here has proved to be very dangerous, and we are glad to see the commencement of a business whereby metallic architectural work can be obtained on short notice.

Geo. T. Bromley. Gas sunlight apparatus consisting of a hemispherical cup of flint glass fitted to a light frame constructed so that it can be screwed upon a gas jet in a moment, and without difficulty. The cup is filled with water, and the rays of light from the gas jet passing through the same are deprived of their yellow tint and heat; at the same time they can be concen-

trated upon any point desired. The light being projected downwards, the eyes can bear a more brilliant illumination than when the light is directly before the face. The odor of gas so used with a drop-light is entirely avoided. For those desiring a brilliant light on a small space, we should judge this invention would be very desirable.

E. Gates. A case of well finished firearms.

C. F. Marwedel. A case of well assorted steel tools, telegraph instruments, and insulated wire; also, moulders' tools, the latter manufactured by himself, and of superior quality.

Linforth, Kellogg & Co. Had a general assortment of builders' and machinists' hardware; but most of their exhibit will be found in Section 6, which see.

M. C. Hawley & Co. A large variety of hand tools and hardware. See Section 6.

Pacific Lamp and Reflector Factory of Emile Bœsch. Displayed a a great variety of lamps and reflectors, all well made, and some of an entirely new design and patented. This branch of industry occupied a minor place in this city until Mr. Bœsch established the factory now in successful operation.

This gentleman manufactures a special class of lamps for mines and mills, whose merit is such that they have been used by the greatest and wealthiest mining companies of the coast. The various gas, railroad and street car companies of the coast now use the lamps manufactured by him. The beautiful and tasteful devices with which they are ornamented render them ornamental as well as useful. As a home industry this manufacture of lamps and reflectors is a most important one, and gives employment to a large number of workmen. It certainly deserves the patronage of all those who wish to extend a helping hand to home industry.

Thompson Bros., Eureka Foundry. Lynch's patent ventilating and illuminating tile for lighting and ventilating cellars, basements, and all other dark places. This tile deserves special mention, from the fact that it is a home invention, and made from materials manufactured here. The ventilating blanks are used wherever they are required, instead of the illuminating blanks, so that any amount of fresh air is provided from every tile, as well as all the light necessary. Messrs. Thompson Bros. commenced business here in 1868, and employ, on an average, twenty-five men. The finished valuation of their products is $70,000 per annum. Their specialties are castings of gas work, lamp posts, hydrants, illuminating tiles and machinery.

W. W. Hanscom, Hope Iron Works. Cast Iron Propeller, designed and manufactured for special purposes. There were four different sizes exhibited. From the well known ability of the exhibitor as a designer and engineer,

no doubt the blades, when put to a practical test, will give a high per cent. of utilized steam power.

Locke & Montague. Marbleized iron mantels and grates. Some twenty different designs of these unique and elegant mantels were displayed by this firm, adding much to the appearance of the north room of the art gallery. A person would be fastidious indeed who could not, among the many exhibited, find a design or color to suit his taste. The marbleizing of iron is a great stride in ornamentation, and probably the time is not far distant when its use will be more general. This firm also exhibited a line of coal scuttles and grate furniture, most beautifully finished. A gas firelog, brilliantly burning in one of the grates, was a source of much wonderment to country visitors.

G. A. Potter, Eureka Marble Works. Marbelized iron mantels of every shade and color. The dull, lustreless iron, so long unthought of for interior ornamentation, is now beginning, by the aid of the artist and chemist, to take its place beside the nobler metals as an article of taste and beauty. In nowise can it be better seen than in the marbleized iron mantels seen in so many elegant drawing-rooms and parlors of the present day. Mr. Potter shows us lapzis lazuli, ebonite, variegated and colored marble mantels, which if real, would cost fabulous sums; yet, by the aid of science, they are to the eye, marbles rich and rare, but in fact, iron with a chemical covering, that brings them within reach of those of moderate means.

R. W. Jackson. Abalone shell jewelry, comprising almost everything worn for ornament. This gentlemen by untiring industry and perseverance has built up a business on this coast that uses up annually an immense amount of our coast shells that would otherwise be exported. The skill in which the shell is cut to show its unfading prismatic colors, the unique style and design of many articles, and the fine workmanship of the settings in gold and silver, show that Mr. Jackson is master of his business. Nearly all visitors from the Eastern States and Europe carry away as souvenirs of their visit one or more specimens of this California industry.

E. T. Bucknam. Ship's lanterns for every purpose.

W. G. Halsey & Co. Kendall's hydrostatic safety lamp. This is claimed to be a perfectly non-explosive lamp.

J. J. Agnew. Lava from the Hawaiian Islands, of many shapes and colors, and neatly arranged in a glass case.

Golden Gate White Lead Color Works, Glassey & Darcey. This is an exhibit of a new industry on this coast; the preparing of colors and pigments ground in oil for painters' use. The display does great credit to the manufacturers, as the quality of the colors are equal to the best imported, while the variety and neatness of the tins and packages showed a thorough knowledge of the details of the business. The business was only commenced this year.

They have four hands employed at present. The estimated amount of raw material that will be used this year and obtained in the State, is $6,000; the rest is imported. The finished value of the product of the works will be near $75,000. Sullivan, Kelly & Co. are the agents.

Selby Smelting and Lead Co. As at previous exhibitions display lead pipe, sheet and bar lead, shot, etc. The manufacture of articles from lead has grown to very large proportions on this coast, although there is only one establishment engaged in it. The rapid development of the base metal mines west of the Rocky Mountains and the immense production of lead admits of our exporting large quantities of that metal; and we are also able to supply the Pacific States and Territories with all the manufactured articles as well. Manufactured lead has been shipped from here to the Pacific islands and Australia. Since the establishment in this city of the Selby Lead Works all imports of this article have ceased, so that now our home markets are supplied with the home product and manufactures.

The Selby Lead Co. was started in 1868, and has been in successful operation ever since. They have a large smelting and refining works at North Beach, beside the manufactory and shot tower on First street. The exhibit made by this company at the Mechanics' Fair is an index of the articles manufactured by them. Shot, lead pipe, sheet and bar lead, etc., are made in all the different varieties. All sizes of lead pipe are made, from one-eighth to six inches in internal diameter, and of all thicknesses. It is safe to say that there are from ninety to one hundred sizes of lead pipe manufactured. Shot of every size is made and has driven all the imported shot out of the market. They also make buck shot, bullets, etc. The shot tower at the works is 225 feet high from the foundations to the ball on top.

The company also manufacture block tin pipe for dwellings, etc. The block tin is more expensive than the lead by weight, but it is not necessary to have it so heavy for proportionate strength. The block tin pipe is preferable to tin-lined lead. It is difficult to get an even coating of tin over the interior of lead pipe so that the lead will not come through in places, and the tin lining makes it no stronger. Moreover, half the weight of block tin is stronger than twice the weight of lead pipe. The tin used is all Australian. Although these Australian tin mines were only discovered a few years ago it is taking the place of all other tin. The tin in England is almost mined out. Before the discovery of these mines in Australia block tin was very high, but now it is quite cheap. They also make solder of all kinds, and in fact all the articles made of lead which can be enumerated.

At the smelting works at North Beach they take the crude bullion, separate the precious metals and refine them for the market. The surplus pig lead, not used here, is shipped away in large quantities. The works are quite extensive and are kept running continually. The crude bullion comes mainly from California, Nevada, and Utah, and is prepared for the market at these works. As before stated, these works and the manufactory are a good instance of the success attendant on preparing and manufacturing a home product, their articles of manufacture having driven imported articles out of

the market, while at the same time a valuable raw material, produced at home, is utilized.

Osborne & Alexander. Had a large exhibit of mechanics' tools, including almost everything used by house and ship carpenters; also the "Desideratum" saws that require no "set" for any kind of wood.

A. Paltenghi. Pure white and colored marble mantels and grates.

Leon R. Myers & Co. White and colored mantels and grates.

J. & F. Kessler. Marble mantels and grates.

John Daniels & Co. Marble mantels and grates.

The above named exhibits of marble mantels and grates was never before equalled in this city, and we believe would be difficult to excel anywhere. It would be difficult to individualize the exhibits, each having points of excellence. For artistic design, chasteness of conception, and the highest order of workmanship, some of the mantels exhibited at this Fair, we believe, would take the highest prize at any exhibition in the world.

F. C. M. Fenn. Meat shaver of his invention and manufacture. A very convenient tool for the purpose. Also good for slicing vegetables.

Gray & Winslow. Zinc monuments of various shapes and designs, cast from pure New Jersey zinc. The exhibitors of these articles claim that they are indestructible, and the only ones (except bronze) that will not change in color, disintegrate or lose their beauty, as marble or stone do, by exposure to the elements. The metal being as fine as silver can be readily cast in any form, and ornaments consisting of wreaths, flowers, leaves and other emblems, may be reproduced true to nature even to the finest lines. A frosted or satin finish can be given them that, as well as the rest, is guaranteed to remain as unchangeable as gold. Our cemeteries that are so exposed to the sea winds and fogs show that in a few years the elements will mar the beauty of the best marble and stone; therefore those who may wish to decorate and mark the last resting place of friends with something that will endure for ages, should examine these monuments.

Fred. A. Clark. Samples of crude and refined oil, from the San Fernando Oil Wells. The product of these and other wells in this State promises soon to be an important item of our home productions.

Tilden & Co. The Monitor Oil Stove, constructed of cast and zinc iron plate. The reservoir for oil is at the back, removed from the flame, and in use it is free from smell or smoke. It is claimed to be very economical, one quart of oil lasting for ten hours. For the household, particularly in this climate, a stove for cooking and other purposes, like the above, is what is needed.

Benjamin Collins. Coey's Cottage Kitchen Oil Stove. This apparatus is

arranged to roast, boil and bake at the same time, a great desideratum in the way of time and expense.

Samuel Hill. The Florence Oil Stove, for domestic use. This is another stove of great excellence and utility. It was in practical operation, and burns without smoke or smell.

The California Vitrified (Iron-Stone) Sewer Pipe Works, Gladding & McBean, Agents. Exhibit a great variety of their sewer pipe, manufactured at their works at Lincoln, Placer County, where they also own a bed of the best fire clay in the State for this purpose.

By skilled labor and powerful machinery—of the latest and best designs—the material is rendered homogeneous and uniform throughout. Under great pressure the pipe is made very compact, and at high temperature becomes of a thoroughly vitrified and iron-like body, which is impervious to the action of acids, gases and steam, all of which are found in the city sewers. This clay takes a perfect glaze from the vapors of salt.

The average number of men employed is fifty. The value of their manufactures the past year was $100,000. The value of the clay used cannot very well be estimated, but the cost of the wood per annum is $12,000. It is one of the solid, important industries of the State.

Portland Concrete Sewer Pipe Co. Sewer and drain pipe of various sizes; also, angles and elbows. It has been found by experiment that the best form for the interior of sewer pipes is that of an egg, the small end downwards, which is the shape this company has adopted. The drainage system of our city is an important one, and its efficiency depends upon the gravitating power of water to remove not only itself, but all the organic and inorganic matter that may find its way therein. As the water derives the power to do this by the fall, size and construction of the channels in which it runs, it is of the greatest importance that the interior should be in such form as to impart to the water the greatest velocity and scouring power, and at the same time to offer the greatest resistance to the pressure of the ground, all of which is claimed by this company in the shape of their pipe.

Pacific Pottery, Sacramento. N. Clark, Proprietor; J. B. Owens, Agent. Vitrified sewer pipe, flower pots, and fire brick. This establishment is the most extensive one in the State, covering a space of two hundred and forty feet square with four kilns, all under cover. The raw material is obtained from Michigan Bar, El Dorado County, where the proprieter owns extensive beds of excellent clay, which is thoroughly mixed and kneaded before being moulded, thus securing a perfect homogeneous article when finished. A side track from the Central Pacific is laid to the yard, thus giving great facilities for shipping; steam power is used for all operations where it can be made available. The average number of men here employed is thirty-five, and the value of the finished products turned out per annum is about $100,000. The matter of good drainage to the public health is of great importance. No

doubt the death rate in all cities is increased a large per cent. by the use of inferior or imperfect pipe.

The durability and superiority of iron-stone pipe, with proper elbows, traps, and connections over wood or other perishable material that absorbs and becomes saturated with filth and deleterious gases is so great, that in all cases it should be used where practicable.

Sacramento Pottery. Bergman Bros., Proprietors; John B. Owens, Agent. Made a large exhibit of Rockingham, stone, yellow, and earthen ware; vases, flower pots, garden tiles, etc. This fine display of ware of California manufacture is deserving of much commendation. By persevering industry and a thorough knowledge of the business, they have succeeded in producing glazed and yellow ware equal in every respect to the best made in the Eastern States, importation of which is now nearly stopped, the Sacramento Pottery supplying the market.

The kaolin used is found in El Dorado County, where it exists in immense quantities, and is of superior quality. The superiority of stone ware for articles of household necessity and other uses is well known; but the high cost in this State has heretofore prevented their extensive use; however, since the commencement of their manufacture here, the prices have been reduced to a low figure. The value of the work manufactured by them last year was from twenty-five to thirty thousand dollars, fifteen men being constantly employed.

The terra cotta ware manufactured by them, such as urns, vases, tiles, and ornamental work, for conservatories, gardens, etc., has a large and steadily increasing sale, the designs being neat, and in many cases really artistic.

Persons who wish to see the progress made in, and the variety of this important home industry, can be satisfied by visiting the immense store room of the agent.

W. K. Vanderslice & Co. Solid silverware. The business of this firm was started in 1858 by the senior partner, he then employing but one hand. It has steadily increased until the present time, their sales the past year amounting to over $150,000. The average number of hands employed is twenty-two, with the best and most improved machinery. 15,000 ounces of silver, .925 fine, is used per annum. This exhibit, taken from the ordinary stock on hand, was evidence of the artistic excellence and good workmanship of their manufactures.

Koehler & Ritter. Made a remarkably fine showing of the skill and taste attained in this city in the manufacture of silverware. Their display consisted of almost everything required for use or ornament, and tastefully arranged in three large show cases.

Schultz & Fischer. Samples of fine silverware manufactured at their extensive factory in this city.

Just in proportion as our city and State has advanced in wealth and prosperity, and the founding of institutions of science, literature and art, so has

kept pace the demand for articles made from solid silver. And not alone in the houses of the wealthy are they found, for by the aid of improved and ingenious machinery, the cost of manufacture has been reduced to such figures as to place them within the reach of those of moderate means, while the purity and unchangeableness of silver as a metal renders it for many purposes of the household even cheaper in the end than baser metals.

Pacific Jewelry Co. A case of gold plated sleeve buttons; their principal merit being in a new and novel way of attaching them to a garment. They are also a California manufacture.

Pacific Gold and Silver Plating Works, Wm. E. Shepman, Proprietor. Large case of samples of old ware replated. To the eye its appearance was equal to solid silver, while the perfect polish showed the touch of a finished workman.

San Francisco Gold and Silver Plating Works, E. G. Denniston, Proprietor. Had a great variety of plated-ware, both on new work and old ware replated, tastefully displayed in a large glass case. The art of depositing the precious metals by the art of electro-metallurgy, on almost everything required, has now attained great perfection, as this exhibit fully shows. A specialty with Mr. Denniston is the preparation of amalgamated plates for mining purposes. One on exhibition this year measured 2 x 7 feet, with a perfect and uniform deposit of silver over the entire surface.

Until quite recently plain copper plates have been merely covered or amalgamated with quicksilver for such use; but practice has proven that silver electro-plated copper plates are much superior, and their use results in a much larger saving of gold. Some report the saving at double that which can be obtained from the ordinary plate. This combination of copper and silver causes the quicksilver, and consequently the gold, to adhere to the plate much more tenaciously, and consequently saves much of the gold that is washed away by the rush of water and friction of sand on the ordinary silver plates. A much heavier coating of silver is deposited on these plates than on the ordinary work.

Anson S. Levake. Improved car wheel. Many attempts have been made at various times to improve our wheels and axles so as to permit the train to pass curves in the road with more ease and a less friction than is the case with the system in vogue. With wheels rigidly fixed to the axles so that they must necessarily turn with exactly the same velocity, there is great friction when rounding a curve, as in that case of course the outside wheel has to travel over more ground than the inner one in the same space of time. This occasions the groaning and screeching noise made by a train in rounding a curve. Since the wheels are fixed to the axle, one can go no faster than the other and must slide or slip along the track. As before stated, many attempts have been made to remedy this objection. Most of these have been tried with one loose wheel arranged in some manner, but when one wheel is mounted upon a

sleeve which turns upon the axle, or when this wheel is divided and it is attempted to unite the parts by flanges or bolts, they are not safe. The axle has been made in two pieces with a sleeve passing over this, but these, with many other devices of similar character, have been discarded by railroad men as too complicated, expensive or unsafe.

This wheel is made in two annular sections, the division being about midway between the rim and axle, and held together by an ingenious arrangement of grooves and flanges, the former, when the pieces are properly placed, being filled with babbitt or other running metal.

In ordinary running the whole wheel turns as one piece, and it is only when turning a curve that the outer part revolves faster than the inner, on account of the increased friction.

G. A. Raymond, Agent Buffalo scale works, N. Y. A large and varied assortment of scales, specially constructed for various purposes, and weighing with accuracy from one-fourth ounce up to seven tons. This is the first time this company's scales have been exhibited at our Fairs, and the unqualified praise of visitors for their precision, scientific principles, finish and general appearance, must have been very gratifying to the agent, and no doubt increased sales will repay him for the expense incurred.

Paul Friedhoffer, various styles and sizes of well finished horse shoes, made by hand, showing skill and good workmanship.

Ventura Rock Soap Co., samples of a natural mineral compound, termed "rock soap." This is found in, as yet, but one locality in the State, scented and put up in attractive packages; it meets with ready sale and is valuable for many purposes, particularly in cleaning metal ware, glass and kindred substances.

F. M. Truworthy, stencil plates and printing wheels. Mr. Truworthy commenced business here in 1856 and has followed it uninterruptedly to the present time. His stencil plates, we believe, are unequalled in the United States both for artistic design and workmanship. In 1874 he added to his business the manufacture of rubber printing wheels, on which he has made several important improvements and received a patent therefor. His improved printing wheel is made with changeable cylinders, and in size from one-half inch in diameter up to eight inches. To many persons these wheels are becoming invaluable, as they afford a ready means for printing on boxes, sacks or other uneven surfaces, as well as for printing business cards, names, etc., on circulars, paper bags or manufactured articles of any kind.

Snook Brothers. Artificial stone manufactured into a fine assortment of variegated and plain tiles for garden walks, conservatories or lobby floors, and many other articles for use and ornamentation. They have recently obtained a patent for the process under which they are manufactured, and claim that the stone is superior, and also cheaper than any other.

Eureka Stone Co. Building blocks, steps, pavements, cemetery work, etc.

This stone is made from California sand, and attracted much attention from business men.

The company has introduced their stone and stone cement into different parts of the State, and it has given unqualified satisfaction. It may be seen in Wade's Opera House, the Commercial Hotel, Baldwin's New Hotel, and other large buildings in this city, and many out of it. In addition to the moulded stone, in the manufacture of which they have obtained such a creditable status, the company covers the front of buildings with its patent stone cement in the manner of ordinary plaster. It never needs painting, and we are informed that after it is once put up it requires no attention whatever.

Sidewalks made from their cement are claimed to be more durable than asphaltum, and very much cleaner and pleasing to the eye.

Ten men are constantly employed at their works, from which they turn out $50,000 worth of manufactures per annum. Of the raw material used in its production, about $12,500 is found in this State.

Pacific Stone Co., Oakland, Cal. Samples of artificial stone for building, cemetery work, walks, flooring, etc. The principal material used by this company in the manufacture of their work is Portland cement, imported from England. They are, however, now experimenting with a cement rock found in this State, and so far have been successful, except in some unimportant kind of work. The company commenced work in February last, and have already turned out $13,500 worth of work. The average number of men employed is eighteen.

A specialty claimed by them is the manufacture of Mosaic or inlaid stone tile in colors, patented June 6th, 1876, and is a substitute for carpet or oilcloth, and particularly adapted to halls, dining-rooms, kitchens, walks, etc., for which the cleanliness and durability cannot be questioned. The materials used are of the best quality, and the actual inlaid color is one-fourth of the thickness of the tile, thereby insuring against any obliteration of the design, which can be of any color or pattern desired.

Thomas McKibbin. Iron wheel barrows. Being almost indestructible; easy running and light. He has a large sale for them throughout the Pacific Coast.

DIVISION II.

Vegetable Products and Manufactures.

Next to mining comes agriculture, or this perhaps first at the present time, and no department should be better represented than that of vegetable products and manufactures. None are more interested in making known to outsiders our varied resources, and the varied staples that we are capable of

producing, than are our agricultural population. None should be more prompt in coming forward to make such an exhibition a success. It is to us what the world's fair at Philadelphia is to the nation at large; and if it does not show the nature, variety and quality of the great staples of this section, and of their allied manufactured products, then has it failed in great part of its design. This year, we are sorry to say, that though on the whole a fair showing is made, yet it is not what might be expected, that at least one important interest is entirely unrepresented, and that the representation of others have been left altogether to the enterprise of the managers of the San Francisco Journal of Commerce. Now this is a matter which we hope to see remedied in the future.

California—the Pacific Coast—will become in fact, now is, one of the graneries of the world, and one of the greatest, and we may now say of it, as was said of Egypt of old, that all nations come to it for bread. Its wheat and flour reach the shores of every land, and it will this year supply more of the "staff of life" to the industrial millions of Great Britain and France, than any other people or nation under the sun, save perhaps Russia alone, and mayhap will not yield even to it. It is estimated that the whole of the United States and Canada will have a surplus for export of 72,000,000 bushels of wheat. Out of this, California and Oregon will ship from 15,000,000 to 18,000,000 ctls. or 25,000,000 to 30,000,000 bushels; nearly one-half of the whole—when Canada is taken out, fully one-half of the whole—and incomparably more than any other section of the Union. The total export of Russia is estimated this year at 50,000,000, but of this, at least 20,000,000 bushels go to Italy and the Mediterranean ports, leaving not more than 30,000,000 bushels for Great Britain and France. Upwards of six hundred large clipper ships will visit this port from all parts of the world this year to carry the "staff of life" to the nations. The wheat crop of California and Oregon this year will be 30,000,000 centals, worth $47,000,000, which is more than double the value of all the gold and silver than two States produce. Without the commerce created by this, San Francisco and Portland would be bleak, desert places instead of flourishing commercial cities. California and Oregon have wheat lands to the extent of 30,000,000 acres; sufficient to produce 600,000,000 bushels, or 360,000,000 centals of wheat—enough to supply ninety millions of people with breadstuff. California wheat, on account of its dryness, is highly prized by millers all the world over, so there does not seem to be any immediate limit to the foreign demand. In the pioneer days we used to look for bread to Chili, and people thought that we would never be able to produce even enough for our own consumption. But that day has long since passed away, and now we find greater treasures and profits over the soil than we could ever have dreamed of finding under it. California and Oregon wheat is well represented by samples of fine, plump, round grain from every part of these two Pacific States, while the farmer and the shipper had an opportunity to compare it with the wheat product of almost every other country in the world. Here is the Egyptian mummy wheat, magnificent in every way, grown in Salinas County, the originals of which had lain dormant for three thousand years in the Pyramids. The samples of flour could not be excelled

in all the world, and represent a great flouring interest, producing one million five hundred thousand barrels annually, of which one-third is shipped to China, Japan, Mexico, Central America, England and other countries. Of this, nearly one-half is produced in this city, and a large proportion of the balance in Vallejo.

The production of ship bread, etc., represented other years at the Pavilion, is a vast industry, in which 8,000,000 pounds of bread were made last year, and 336,000 pounds exported, mostly to the Pacific islands. The conversion of California wheat into spirits is one of our notable and prominent interests, representing in this city 1,500,000 gallons yearly, worth $2,000,000, We should, however, did we supply the place of the Eastern spirits and whiskey imported, put up double that quantity. The manufacture of starch from wheat in California has always been very feeble as an industry, though we import very heavily from the East, and to some extent from England and China. California starch was not represented in the Exhibition. Upwards of 75,000 boxes of maccaroni, etc., were also made in the city, though not represented.

The fine samples of barley displayed both from California and Oregon, notably the one where one hundred and thirty-five heads are shown having sprung from one kernel, gives an idea of what is capable of being done with this important cereal. Important, because California and Chevalier bearing barley is in demand all over the world, finding its way even to far distant Britain. It is of course exported for brewing purposes, and this reminds us of the great importance of the brewing interests of this city, and what room there is for its expansion. The one may be gauged when we state that 280,318 barrels were manufactured in this city last year, and that upwards of 24,000 kegs of foreign ale and porter were consumed on this coast. But notwithstanding the magnitude of this interest, we had to go to Boston to obtain an exhibit in this particular line. Oats, rye, buckweat and other cereals of minor importance, have had a fair representation in the Exhibition.

It is only about three or four years since the culture of tobacco began to be successfully prosecuted in this State. Since then we have had some fine displays of California tobacco on public occasions, notably so in the last Mechanics' Fair. The three or four years that have elapsed since the industry was first started in a humble way near Gilroy, have witnessed gigantic strides taken in its cultivation. Already it has spread over various counties of the State, and it is said the Havana Leaf, from the Havana seed, has been cured to equal that raised in Cuba. However that may be, it forms a great and growing industry. Last year 1,500,000 lbs. was raised, while much more will be raised this year. That there is ample room for the extensive cultivation of nicotian weed, may be seen when it is known that the annual importations equal 4,000,000 lbs. for smoking, and that 1,800,000 lbs. were used in making the 113,000,000 cigars turned out of the 120 factories last year in this city. The cigars were worth in round numbers $5,000,000.

We have had sugar, all the way from the distant Austalian colony of Queensland, which is beginning to take high rank as a sugar producing country. This reminds us that we consume from 65,000,000 to 70,000,000 lbs. of sugar

annually. The refining of it employs two large refineries and several hundred men, and that it is worth when refined about $7,000,000, and that 660,000 gallons of syrup are also made annually, of which large quantities are shipped abroad. Now, sugar cane will grow in Southern California, and we see no reason why we should not produce considerable of the cane sugar consumed within our borders. But it is in beet culture that California must principally depend in order to supply herself largely with domestic sugars. The difficulties incident to the early stages of the beet sugar industry of the State are rapidly passing away, and in the Pavilion California made a good showing both in beets and beet sugar from Sacramento. The same price is now obtained for it as for any other sugar.

The area under cultivation is rapidly extending. There are altogether about 500,000 acres in the State suited to its culture, which could produce 500,000,000 lbs. of sugar, worth $60,000,000, at present prices; that is to say, it could produce enough to supply one-third of the total consumption of the United States. But there are not wanting those who aver that the area available for beet culture is much larger than here stated.

The sugar could readily be sold at 7½ cents per pound, with a good profit, so that it could compete with any sugar made from cane, at present sold in the United States. The product this year will be about 300,000,000 pounds. There is a magnificent future before this industry. But beets are not the only source of sugar which is likely to be utilized in this State. The great productiveness of melons in saccharine matter is well known, and advantage is about to be taken of this to utilize them for the production of sugar. They will yield about ten per cent. in weight of sugar, while from the seeds a useful oil can be extracted. At Isleton, on the Sacramento River, a factory is being erected, which will be running in about two months. The company starts with a capital of $2,000,000. Its principal promoter has been Dr. Hiller, Sr., of this city. It is also well established that the Chinese Sugar Grass is capable of profitable cultivation here, so that we have many sources for producing this important article of commerce. As to the field for consumption, we have the whole of the United States, which needs 750,000 tons annually, and no part of the Union is so well suited to beet culture as is California.

Much has been said and written during the past two years as to the profits of cotton growing in California, and as to the area suited to its production, though of late the excitement seems to have died away. It is not probable that it will soon be revived again, though there is no doubt that the matter will be taken up, and the profitableness of its culture investigated in a practical manner. The presence in the Fair of three fine specimens—one of a cotton plant in full bearing from Colusa County; a second of pure white cotton from Merced County; and a third from Tahiti—will do much to interest the agriculturalists of the State, who have not yet investigated the matter for themselves. The specimen from Colusa County was taken from a field of 200 acres, which have yielded from 270 to 300 pounds per acre. The amount hitherto raised in the State has been small, the quantity received in the city last year being only 512 bales. Its culture is, however, a matter of the utmost importance to California, as the value of cotton cloth for domestic

consumption used annually on this coast is not less than nine to ten millions of dollars, equal to sixty million pounds of raw cotton; while if we take into account the quantity used in mixed goods, with silk and woolen, the total will be much larger. Then there is a large field for export of manufactured goods in the countries and islands on the coast of the Pacific, which have been long supplied with an inferior and adulterated article from the looms of Great Britain. Cotton culture and manufacture would of themselves raise California to the position of a great industrial and commercial commonwealth.

One of the most striking vegetable exhibits in the whole pavilion is the magnificent hop-vine, which forms on a trellis a kind of archway leading to the exhibits made by the San Francisco Journal of Commerce. This mammoth vine comes from Alameda County, and is twenty feet long, has rich, full heads, and much exceeds in size the magnificent one shown in last year's fair which came from San Jose. It is among the largest, if not the largest and most prolific hop vine in the world, and speaks well for the hop producing capacity of this coast. The production this year will be about 8,000 bales, which will sell at ten or fifteen cents per lb. This is likely to prove a most promising industry, as the beer drinking capacity of the world is practically unlimited, and the Eastern States and Great Britain will take all the surplus hops that the Pacific Coast is ever likely to raise.

Those who are curious in the matter of Hemp have had a fine opportunity of comparing the California product with that of other lands. For here samples of California and Manila hemp were to be found. The California specimen consists of several stalks, ten feet high, grown in Alameda County by one of our cordage companies, and grown since April last. It is, however, said that the Manila hemp will not grow on this coast. Its culture is being attempted in the Sandwich Islands. The manila hemp is shown prepared for manufacture into cordage, while its color and texture show that it is capable of being applied to other uses than rope making. Of its importance as a staple some idea may be formed when it is known that 18,000 bales or 50,000,000 lbs. will be imported this year from Manila, and that in proportion as the manufacture of cordage increases in magnitude, the quantity of hemp needed will increase also. The magnificent display of cordage made shows the rapid strides the industry has made in this State. Here, everything from a pack-thread to a hawser may be found. A few years ago a very large portion of the cordage consumed in the State was imported, but now the two local factories have it nearly all to themseves, and turn out goods worth over $750,000 annually.

From Portland, Oregon, comes samples of Flax, raw and manufactured. Oregon is destined at some distant day to attain great prominence as a flax raising State. It has already attained such distinction, that large quantities have been shipped to Belfast, Ireland, where it is manufactured into linen. And not alone is the fibre useful, but the seeds are imported largely by the Pacific Oil and Lead Works for the production of linseed oil. California also supplies large quantities of flaxseed for the same purpose. In the north of the State, the flax raised is more suitable to linen manufacture, while in

the south it runs more to seed, and is more suitable for the manufacture of oil. The value of linen imported to this coast is very large from Great Britain, Germany and France, so that room exists for the establishment of a most flourishing industry among us in the matter of linen weaving. The production of oil from the seed, in conjunction with that of castor oil, employs half a million dollars capital, while the product is $300,000.

The probability of raising jute in this State is beyond a doubt, and a more important product we could hardly have. The manufacture of jute into grain sacks has enriched the City of Dundee in Scotland, giving it a large and prosperous population, and affords employment to large numbers in other cities of Great Britain. California and Oregon will use 25,000,000 grain sacks, besides large numbers of potato sacks. The former will alone be worth in the market, first hand, $3,250,000. Every year the quantity will be increasing, and not many will elapse before there are used 30,000,000, worth close on to $4,000,000. The greater portion of these bags are imported ready made from Dundee or Calcutta, but a beginning has been made in the manufacture of bags from the jute, while the manufacture from Burlaps has been long and profitably carried on. The factory at Oakland imports jute by the thousand bales, weaves it into cloth, and makes the bags. Started originally as a cotton factory, it finally became a jute, cloth and bag factory. This year it will turn out 3,000,000 bags, worth $375,000. The bag factories of this city this year have employed several hundred hands in manufacturing bags from Burlaps and Hessiens, will work two months longer than usual this year, and will turn out 6,000,000 bags, worth $750,000.

Ramie has been experimented on in the State, and it has been found that it can be raised, but some difficulty attends its utilization here, as elsewhere, and that is the lack of a machine that will be able to clean and separate the fibres well and economically. A couple of parties in this city claim that they have invented such machines, but their merits are yet to be tested. Some samples of Ramie and a Ramie cleaning machine were on exhibition in last year's Fair, but this year they have been absent.

Samples of California Pulu, or what is known as such, have occasionally been received in this city, but nothing of the same kind has as yet been had in sufficient quantities to supplant the Hawaiian product. Eureka hair has, however, supplanted it, and 1236 bales of it were received in this city since the beginning of this year. Tules are now being utilized for the same purpose.

The wild mustard of California is luxuriant in growth, and almost illimitable in quantity, and it has long been utilized at a factory in the city. It has been cultivated with success, and great quantities of it are shipped over the railroad to the East. The value of the locally manufactured product is not less than $170,000 annually.

The value of broom corn raised and of brooms manufactured in the State is very considerable, and large quantities of both are exported to Honolulu, Australia, China, etc. The value of brooms made in this city is not far from $200,000 a year. This class of goods has been well represented in the fair.

It has been often claimed that California grew wild coffee, but it has gener-

ally been proven that it was some other wild shrub. Some Japanese started the culture of tea here a few years ago, but were unsuccessful. If, however, California is not to be known as a coffee or spice producing country, it is a great coffee and spice consuming country. The coffee and spice mills of the coast turn out annually about 8,800,000 pounds of coffee, and spices proportionate.

EXHIBITS IN SECTION II.

WARD & Co. Boston Ginger Ale; a pleasing and effervescing drink. This exhibit, their first in this State, was very tastefully arranged, and attracted much attention. The result has been very satisfactory to the exhibitors, as many orders were taken during the fair.

CONRAD & Co. Soft-shelled almonds, of very fine flavor and large size.

W. F. BURTON. Improved patent Italian awnings, for the lawn or windows. Mr. Burton makes a specialty of these awnings, and their superiority will be attested to by hundreds throughout the State that have them in use. Not only are they superior in facility of raising and lowering, but also in general appearance, harmony of colors, and artistic design and finish.

L. D. CHILLSON. Samples of barley, of which 135 heads were produced from one kernel; also, of wheat, which produced 22 heads from one kernel. Both the above were raised in Fresno County.

D. L. PERKINS, Sherman Island, Cal. Had some very fine samples of wheat. Some called the Butte wheat, cut in 1874, yielded sixty-five bushels per acre, and some called the Australian, cut the same year, yielded sixty bushels.

A. CLEAVLAND, Alameda Island, Cal. Sample lot of hops that yielded on the average one ton to the acre.

STARR MILLS, Vallejo, Cal. Exhibited three sacks of their superfine flour, which, for quality, would challenge the world.

SALT WATER BATHING Co. A complete outfit for the bath room, or sea bathing. Sea bathing, which has been so little indulged in by our citizens, will probably increase, owing to the conveniences and facilities that this company have arranged for the public.

PACIFIC OIL AND LEAD WORKS. Had a fine pyramid of their manufactures, from the seed up to the best refined article—clear enough to eat, so far as appearances go. California and eastern castor beans, Calcutta flax seeds, and oil cake form the base, and rising step by step we find large jars of raw oil and boiled oil, smaller jars of refined linseed oil, tiny flat bottles of double refined oil, and some filled with cocoanut oil, all demonstrating their ability

to turn out any grade of oils that the dealer may desire to purchase. The culture of flax to raise seed for these works is quite an important industry in some parts of our State, and in time the importation of linseed oil will be counted among the things that were. Castor oil can be more cheaply produced here than imported, as the bean is particularly pleased with our soils and climate, and once put into the ground becomes, as it were, a weed, and hard to kill. This company work up both the castor bean and flaxseed, and buy all that is offered.

Bedspreads. There were twenty-four exhibitors of bedspreads, and each exhibit had peculiar features of its own, either in style or pattern They were made at different periods of the world's history, the oldest dating back to the year 1545, when it was made by the great grandmother of one of the Puritans who came over in the Mayflower in 1620. The period of life at which they were made also varies greatly; from the age of nine years upward until one was finished on the one hundred and first birthday. The number of pieces in the spreads varied from twenty to eight thousand eight hundred and thirty, the highest number, and that one was made by a Captain in the Police Department of this city.

There is nothing amongst our household treasures that can recall so many tender memories as the old patch work quilt, made by the patient hands of loved ones who minister to our comfort here, or have been folded and laid to rest in the quiet church yard. Every piece has some rememberance or history of its own, and could those remnants of the garments of the dead and gone but tell the hopes and fears, the joys and sorrows of the hearts that beat beneath them, what an insight into human life would they give us. We are glad to see these quilts on exhibition; they tell a tale of feminine taste, economy and industry that adds so much to the charm and assistance of the household. (For the list of exhibitors see catalogue of exhibits.)

J. M. Broom. Specimens of Tappa cloth made from the bark of trees by the Natives of the Navigator Islands.

Hartshorne & McPhun. Curtains and curtain fixtures; the latter (self-acting) is their invention, and is extensively used here and in the Eastern States. The former were beautiful specimens of the upholsterers' and decorators' art.

Mrs. J. H. Nevins. A hat made from the spines or leaves of the sugar pines. This hat has done service at two previous Fairs, and promises to be a feature at the next, is an ingenious specimen of woman's handiwork, showing how the commonest materials may be made into articles of use.

Miss Francis Ware. Lace tidies; finely wrought, and of tasty design.

D. Samuels. Several cases of fine imported laces. Much admired by the ladies, but generally shunned by men who had wives or daughters. Also fine underwear.

M. Freud & Son. Ladies' underwear, embroidery, corsets, bustles, and other things pertaining to a lady's wardrobe, very difficult to understand and explain. He also exhibited a number of ready-made dresses for ladies; cut and made in the latest style. This firm are large manufacturers of the above goods, and constantly employ a large number of hands.

Miss Abby W. Baker. The indefatigable and polite agent of the Boston Dress Reform and sanitary undergarments for women, displayed a full line of the goods; and by so doing, evidently done much towards their introduction in this city.

The advantages claimed for these dress reform undergarments are: that they give greater ease of motion, no pressure on muscle or veins, suspension of garments from shoulders, and consequently improvement in health and disposition. If women would receive and adopt the principles embodied in this dress, which is a truly healthful, comfortable and convenient costume, and can be worn without painful notoriety, the almost universal discomfort and suffering of which they complain now, through the tyranny of fashion, would be nearly, if not quite, abolished.

Mrs. H. Heyman. Hand made laces and insertions, of most exquisite patterns and delicate handiwork.

Miss M. M. McGrill. Corsets and shoulder braces for ladies of approved shape and construction. Her own manufacture.

Mrs. M. McGrath. Corsets and ladies' underwear; also, fine embroidery.

Mrs. H. Cantel. Laces cleaned and mended, and done up in a manner that showed the lady's skill and handiwork in this department to be of a high order.

Lyman Alexander. Made an interesting exhibit of corsets and their manufactures, two or three hands being at work day and evening.

Mrs. Townsend & Miss Schneass. Had a neatly arranged and interesting exhibit of artificial flowers, mostly manufactured by them at their stand, during the exhibition. The hanging baskets were particularly fine, and it would puzzle any eye but a florist's to distinguish the contents from natural flowers.

Mrs. M. E. Anderson. Case of millinery, and the only one on exhibition. Mrs. M. has just started in business, and the articles shown give proof that she will succeed, if elegance of style and the admiration of ladies are any criterion.

Mrs. A. G. Nye. Sea mosses of most beautiful selection, carefully prepared. The sea mosses found on the Pacific Coast of California are acknowl-

edged by the best authority to excel all others, both in variety of formation and delicacy of tints. Mrs. Nye makes a specialty of their collection and preservation. Her albums, containing many varieties, are tastefully gotten up, and would make an appropriate gift to any person.

Albert G. Nye. Sea mosses in frames and vases. These mosses were arranged as wreaths, bouquets, etc., and could be verily termed "flowers of the sea."

Rev. Dr. Bettleheim. An aged damask table cloth, made in Germany in the year 1742.

Flint, Peabody & Co. An assortment of paper barrels, half barrels, and pails. This growing and important industry of this coast was well represented. We regret that no information regarding their manufacture has been furnished us.

Armes & Dallam. Paper carpet or cloth, made to imitate floor oil cloth; also, paper ware for various uses, as basins, spittoons, etc. (imported.)

Pioneer Paper Mill, S. P. Taylor & Co. This mill is located at Taylorville, Marin County, and commenced to manufacture paper in 1856, and have continued the same in connection with a general paper warehouse ever since. The varieties of paper manufactured at the mill embrace printing paper, Manila and hardware wrapping paper of great variety and kinds, from the finest tissue to the heaviest wrapping. The number of hands employed is about fifty men, women, children and Chinamen, the latter being gradually diminished, and whites taking their place. The value of raw material used is about $25,000 per annum, and is all produced at home, excepting a few chemicals. The value of the product of the paper mill is about $60,000 per annum.

The exhibit in the late Exhibition embraced samples of rag news of a superior quality, book paper, white hanging paper in rolls, which is used chiefly as a foundation upon walls or fresco work; also blue and Manila paper. The products of the mill is shipped to their warehouse in this city, where it reaches the various avenues of trade.

San Francisco Cordage Co., Tubbs & Co. This display comprised Manila rope and hemp, Sisal bale rope, tarred lathyarn and lanyard, etc.; in fact, everything in the way of rope from a clothes line up to a 3-inch hawser. Some are beautifully white, made from the fibre of the maguey of Mexico. Some of darker hue of Manila, and some tarred hawser for use in mines where water is abundant. Surmounting the whole is a large mass of the raw material from which the rope is manufactured.

Their factory is located at the Potrero, not far distant from the Southern

Pacific Railroad depot, and is very extensive, employing about one hundred hands in all, and being the largest factory of the kind on the Pacific Coast. Their office and salesroom is at 611 and 613 Front street, where they have a large two-story building filled with a well assorted stock, and by telegraph can order from the factory any special kind required, and have it manufactured and shipped within twenty-four hours.

Messrs. Tubbs & Co. are making considerable of the light colored rope on exhibition for inland use. It is not quite so strong as the Manila, but the material is much cheaper, and for ordinary uses it is sufficient, and is in general use in the East. They have completed arrangements for the direct importation of the raw material from the Mexican Coast, which is called Sisal hemp, and is the fibre of the maguey hemp, a species of aloe. Manila is the fibre of the plantain, which much resembles the banana tree.

The capacity of the factory is about five and a half million of pounds per annum, but it is not run constantly, as the supply would exceed the demand.

San Francisco Journal of Commerce. Samples of cotton, cereals, fruits and vegetables from California and other countries. (See Section 9.)

California Oilcloth Co., H. Corbett, Agent. Floor oilcloth in many different designs and of various widths. This is comparatively a new industry on this coast, but the display shows the manufacture to be a success.

Pacific Rubber Paint Co. Rubber paint displayed in tins; also specimens of work done with various colors of the same.

Deaf, Dumb and Blind Asylum, Oakland. A fine collection of cereals raised in the farm of the Asylum.

Isaac Friedlander. Twelve jars of cereals raised in the San Joaquin Valley lands, and showing its wonderful fertility.

J. H. Campbell. A collection of cereals from all parts of the world. This exhibit, gathered at considerable expense, was instructive and interesting, showing at a glance the different grains used for food in almost every part of the earth.

T. H. Follingsby. Sample of wild native coffee found in Tuolumne Co. Has the taste and smell of the cultivated, and merits attention from those engaged in the cultivation of semi-tropical products.

R. J. Trumbull. Seeds of all kinds used in gardens and for ornamentation; also, garden implements, lawn mowers, etc.

B. H. Deane. Stalks of corn 16½ feet high, grown in Stanislaus County.

California Beet Sugar Co. Samples of cube, crushed and powdered sugar produced at their factory. This company commenced operations in 1870 at Alvarado, Alameda County, where several hundred acres were planted, and a sugar mill, with a capacity of fifty tons per day, erected. The mill continued work for three years, when, for measures of economy, the works were moved to Soquel, in Santa Clara County, where fuel and land were much cheaper. The results have been eminently satisfactory, and the works are now in successful operation.

Sacramento Valley Beet Sugar Co. Samples of beet sugar, and of the sugar beet used for its manufacture. This company was the first to attempt this branch of our home manufactures. For a long time matters were discouraging. Many disappointments and reverses took place, but in 1874 it was pronounced a success. The mill has a capacity for working eighty tons of beets per day. They have a farm of 750 acres, which yields from five to twenty tons per acre, and yielding an excess of 10 per cent. of sugar at the factory. The mill commences operations early in August, and runs night and day during the season. About thirty men are employed in and around the works.

The establishment and successful working of the two factories named above must be a source of much gratification to those who have watched the progress of our industries, for they have demonstrated that California is not dependent on any other country for her sugar, but, on the contrary, in a few years can supply all of her own consumption, beside having a surplus to export.

J. Vogeley & Bro. French and American candies in great variety, and of fine flavor and appearance. A specialty of this firm is the manufacture of French and fancy candies.

W. S. Townsend. A large case of plain, fancy, and crystal rock candies.

California Rock Candy Co. Rock candy and rock candy syrup, of most delightful flavor and clear as crystal.

Bowen Bros. An extensive and full line of groceries, both domestic and imported.

DIVISION III.

Animal Products and Manufactures.

Of all the animal products of the coast, varied and interesting as they undoubtedly are, first on the list stands wool. The growth of the wool interests

of the State, and of the coast, have been really wonderful, and if the past is any criterion of what the future shall be, the Pacific Coast is destined to be the great wool section of the United States.

Prior to the occupation of the country by Americans, there were few or no sheep to be found, and long after the attractions of treasure seeking set aside the prosecution of agricultural and pastoral pursuits to a more slow going era. It was not until 1855 that any wool of consequence was produced in California, and then it was usually small, being little over 1,000 bales. Little did the pioneers of the early days dream that ere twenty years had elapsed, the wool product of the coast would mount up into the hundreds of thousands of bales annually; but so it was destined to be, and the probable product of the coast this year, including the State, will be 50,000,000 lbs., worth say $7,000,000 to $8,000,000. It differs widely in quality and character; the wool from the northern counties and from Oregon being esteemed the best; while those from the south are dirty, burry and greasy. In fact, all Pacific Coast wools carry East with them a very heavy per cent. of dirt and grease, and this is a great detriment to them in the markets of Boston and New York. The wool product of California and Oregon has been represented by some very fine fleeces, one weighing thirty-two lbs., and another, a ten month ewe's, weighing fifteen lbs. The length and fineness of fibre of these samples is remarkable. The total wool product of the Pacific Coast States and Territories for twenty-five years has been 321,000,000 lbs., worth $63,000,000; of which California has carried away the lion's share, 274,224,233 lbs., worth $54,000,000. Should the wool product of the coast continue to increase in the future as in the past, inside of a dozen years it would supply enough raw material for half the factories in America. Among the exhibits at the Fair, have been also some very fine samples of Australian wool.

Our manufacture in wool does not compare favorably with our wool product. While we import woolen goods worth from first hands $12,000,000, we do not manufacture more than $4,000,000 worth. Of these goods $2,000,000 worth are manufactured in San Francisco, at the two great factories now running under the same management. Here blankets, flannels, rugs, tweeds, cassimeres, hosiery, etc., of excellent quality are made, and within the past year even dress goods of very good quality and popular styles have been manufactured. By and by we shall do better.

The manufacture of clothing to the amount of $3,000,000 is carried on in this city, and some large establishments are engaged in the business, in which the Chinese are, to a great extent, largely interested. Notwithstanding the promising appearance of this industry, by much the greater portion of our clothing is imported from abroad, principally from New York.

After wool, silk naturally comes; but notwithstanding all that has been said and written about silk culture in California, it is as yet nothing more than a name. We have had no exhibits of California raw silk this year, the indefatigable Neuman having betaken himself, with his cocoons, to Philadelphia. Silk thread is the only thing of California production that is shown, and even that is made from imported silk. It is of very good quality, but for some reason or other misfortunes seem to have followed close on the in-

dustry here. It is to be hoped, however, the future will be brighter. Silk ribbons, to some extent, have been manufactured in Alameda County, and a large silk factory on a large scale was about a year a half ago established on the outskirts of this county, but it seems to have given up the ghost. There is, however, one place in San Francisco where silk piece goods are manufactured, and that is at the corner of Stockton and Post streets, where M. Vianny, an industrious Frenchman, may be seen attending to his loom all day long. There is not a particle of doubt that the silk-worm can be raised in California, and that silk can be profitably manufactured here; but those who have the welfare of the industry at heart must bide their time.

The hide and leather interest, and the manufactures from them, next challenge the attention, on account of their importance. The number of hides received annually into this city is about 200,000, and the number slaughtered here about 160,000, making a total of 360,000. Of these, about one-half—probably, even more—will this year be exported to New York. The balance are converted into leather in the fifty tanneries of the State. The manufacture of leather has fallen off very heavily during the past year, not more than one-half the leather being made that was made last year, and some of the tanneries even shutting down. This has been due to the decline in the export demand, and the decline of the demand from local manufacturers. The quantity produced in the State for the year previous to this was about 6,000,000 lbs., worth $2,000,000. Amongst this was some really fine harness and morocco leather, made in this city, and fully equal to any ever imported. Outside of San Francisco, Santa Cruz is the principal seat of the industry, as bark is found in large quantities near it. Next come Sacramento, and then Stockton. It is the opinion, however, of practical men that San Francisco Bay will be the great centre of the leather manufacture on the coast, as the bark on the Coast Range will be of easy access by means of a narrow gauge line run up into the mountains. The export of leather to Japan a couple of years ago was very heavy, but since then the Japanese have begun to manufacture their own leather, and it has fallen off. Heavy shipments have been made during the last year to Great Britain, Germany and France, but they have been merely speculative. There is not the prejudice against our leather in Europe (it being oak-tanned) that there is against Eastern, and if a market could be established in these countries for California leather, it would be a God-send to our tanners.

From the leather manufacturing we naturally turn to the manfacture of boots and shoes. This great industry this year has been represented by one solitary exhibitor, while in other years there were several. This is not as it should be in a city that boasts half a dozen establishments that are first-class, and the value of whose industry in that line is not less than $4,000,000. Imports this year will, however, be very large; at least 50,000 cases, containing 600,000 pairs, worth a million and a half of dollars at first hand. The importation of these takes the bread out of the mouths of hundreds of workmen and workwomen. They should be made here, for it is one of the greatest anomalies in the world to ship hides to the East, paying freight interests, profits, etc., and then bringing them back again in the form of boots and shoes, and with much heavier charges and profits to pay.

The manufacture of saddles and harness, like that of boots and shoes, has not been so prosperous this year as in former ones, yet it includes some of the largest factories in the city, and is worth over half a million annually. One of the firms had an exhibit in the Pavilion—one characteristic of the Golden State, and which outside of the Pacific Coast and Mexico, probably could not be witnessed anywhere else in North America. We refer to the magnificent display of saddles, Spanish-American in style, silver-plated, and of workmanship so superb as to be truly artistic. We think in time a large and valuable market for goods of this class could be found in the cities of South America.

In an age like the present, one that may almost be termed the age of machinery, belting is one of the most important adjuncts of manufacture. By its aid power can be transmitted from great distances, and as happens in this city, one steam engine in a cellar can supply the motive power to half a dozen blocks. This manufacture ought therefore to be of some importance in this city—and so it is—taxing the energies of two principal firms, one of which manufactures leather belting, while the other makes use of fulled rawhide. They also manufacture hose, and between them add about $100,000 annually to the value of the industries of this city and State.

Glove making is important among the minor industries of this State, and furnishes a means of utilization for thousands of skins of deer, etc., besides giving employment to a large number of girls and young women, who otherwise would be destitute of it. This city embraces three factories, but there are at least twenty small ones in different parts of the State, all of which have sprung into existence within a few years. None of them have been represented in the exhibition this year, which, as some of them turn out the finer kinds of articles in this line, is we think an oversight. Most of the gloves are those intended for driving, riding, and hard work in the harvest and hay fields. But there are some very fine kid gloves indeed turned out in this city, and with a little more care and attention, some of the factories could produce work which might ere long hope to rival in this respect that of La Belle France. The value of this industry may be placed at about $250,000 annually.

Next to wool and leather, the salmon fishing business on the Columbia may fairly claim to take rank. It was well represented; samples of canned fish from twelve different factories being exhibited this year. This at once attests the value of this industry. A few years ago it was comparatively speaking insignificant; the production not exceeding a few thousand cases, but it has since grown to mighty dimensions, and may not inaptly be described as one of the wonders of Oregon. During the present year, the spring catch reached 401,000 cases, of an average of fifty pounds, making a total of 20,000,000 lbs., worth at wholesale rates the vast aggregate of two millions of dollars. It is worth more to Oregon than her coal mines and lumber mills; more than anything else, but her wheat. Of this mighty draught of fish, three-fourths was sold to the merchants of London and Liverpool a year before it was caught; before the fish had ascended from the sea. England and the East are our great customers for it. The former spreads it over Europe, and over all her colonies. Its cheapness has almost ruined the noted salmon fisheries of Scotland, and now Columbia River salmon, labelled as Scotch, is shipped by

London houses to Australia. From this city the salmon has this year been exported by the ship-load. Salmon cargoes, more valuable even than wheat cargoes, having left this city during the past four months. One was worth $206,515.90.

Pork packing in San Francisco is not what might be expected to be found in a western State, and one that possesses so many facilities for successful hog raising. In this line, when compared with Chicago, Cincinnatti, or even places of less repute, San Francisco is nowhere; although she might be the source of supply in these articles to a large and constantly growing population, tributary to her in a commercial sense. The cause, however, is less to be attributed to lack of enterprise on the part of those engaged in the industry, than to the neglect on the part of farmers. However, we may expect to see a change in this respect soon. Year after year the corn crop is growing heavier, and it cannot be well utilized in any other way than in hog feeding. Then in years like the present, it would pay as well, if not better, to raise hogs with wheat than to ship it. But however this may be, certain it is that the production of hams, bacon and lard is miserably inadequate when the consumption is taken into consideration. The production of California hams, bacon and lard last year by three large establishments and several smaller ones was only 7,500,000 lbs., valued at $950,000. How far this fell short of consumption, may be seen when it is known that imports reached 12,000,000 lbs., valued at $2,000,000. There is no exhibition of these goods this year, although we think that it was a mistake on the part of the manufacturers to refrain from doing so.

Some samples of fish oil bring to mind a great and constantly advancing industry—that found in the ocean and shore fisheries of the North Pacific and of our coast. Consequent on the destruction of the North Pacific Whaling squadron by the Shenandoah, the industry languished, and it was only last year that it began to assume its normal proportions. Then the fleet brought in 17,805 bbls. of whale oil, 144,305 pounds of bone, and 37,154 pounds of ivory. During the same season the Pacific Cod fleet brought in 508,850 cod; so between the two fleets a pretty good showing was made, but nothing like to what may be expected to be seen in future, when more capital and attention is paid to it. The production of what is known as coast whale oil, which includes, also, oil prepared from the shark, devilfish, etc., is becoming quite an important branch of industry. Last year a great quantity of oil was produced in this way, and—while on the subject of animal oils, though hardly relating to this branch of the subject—we may note that a considerable quantity of meat oil was made last year in this city.

We next come to the subject of furs, of which two nice exhibits have been made, but nothing at all approaching what the magnitude of the interest demanded. It is a subject not often adverted to, and, consequently, it is not generally known that a great part of the fur trade of the world is gradually settling in San Francisco, and that by and by this city will become a great depot from which to supply the nations. Last year the receipts of furs in this city from Alaska, Asiatic Russia, and elsewhere, reached the great num-

ber of 240,000, worth, in the aggregate, over $1,200,000, and the receipts are largely increasing.

One of the notable defects in the class now under review was the total absence from the pavilion of one of the greatest industrial products of the State—honey—greatest in view of the probabilities of development connected with it. Los Angeles and San Diego counties are the two great sources of this invaluable staple, the value of which is increasing annually at a notable rate. The product for the present year is estimated at 2,000,000 pounds. Great quantities are shipped out of the State to the markets of the East, and of late many thousands of pounds have been shipped by clipper to far distant England. Of beeswax, vast quantities are shipped from San Diego by the mail steamers to New York. A fine specimen of the product was displayed in the pavilion. Though not one of the products of the State, or of the Pacific Coast of the United States, the canned turtle, from Rogers, Meyer & Co., which was shown on the "Journal of Commerce" stand, is worthy of notice, on account of its great prospective value as an industry, and its development by citizens of the United States. It was pioneered by an old gentleman named Scoffy, who worked at it zealously for many a long year, until age and infirmities compelled him to resign it into other hands. There is no doubt that there are "millions in it," and no long time will have elapsed till this delight of aldermanic feasts will be shipped from its native tropical *habitat* to gratify the tastes of epicures in every corner of the civilized world. Closely connected, so far as the *habitat* is concerned, with this delicious half fish, half reptile, are the oysters and clams of the Pacific Coast, which are already beginning to be put up in tins, and the packing of which will doubtless by and by become a lucrative industry.

We have spoken of much in this section that has been unrepresented, and as we draw to a close, several other important ones throng on our recollection. Notably amongst them is glue, which is manufactured here of very superior quality at the rate of several hundred tons a year, and the largest share of which is shipped east. Besides glue, the establishment in which it is manufactured turns out neat oil, already alluded to, and curled horse hair, the material of which, singular to relate, is imported all the way from South America. The total annual product of this one establishment is not less than ninety thousand dollars in value.

Of tallow, which is so useful in many of the manufactories, there was no exhibit; there was, however, candles and soap. Of the former, fine samples of crystal wax was shown by the San Francisco Candle Co. Of the latter, some very choice specimens of home and eastern manufacture, and of the celebrated Rock Soap of Ventura County. The candle factories of the city make 100,000 boxes yearly. The soap factories, 14,000,000 to 16,000,000 lbs.

There are many other products of minor importance, such as hoofs, horns, etc., raw products of the State, that were not at all represented. It is to be hoped next year that the display in Division III will be one of the most notable in the entire exhibition.

EXHIBITS IN DIVISION III.

H. N. Cook. A large and fine assortment of articles manufactured from leather. Among them we notice a 24-inch double belt of oak tanned sea lion hide, also a 30-inch do.; some fine hides dressed lacing leather; bullion bags, fire buckets, hose nozzles, and canvas sacks. All are well made and creditable to his establishment.

Samuel C. Gray. Sole leather, "Union Crop and Oak Sole." This leather, manufactured at Santa Cruz, was examined by many experts and pronounced to be of very superior quality, grain and finish. Not content with following in the beaten track of careless and indifferent tanning, and in full faith that "*the best is the cheapest*," Mr. Gray, who has always striven to present an article entitled to take the lead in the market, is now engaged in making a specialty of this Oak Sole Crop Leather, which by being carefully handled from the time it enters the vats till it passes from the hands of the finisher, is intended to be made a standard article, without a rival, short of anything the old world can produce by the hands of its most skillful workmen.

Pardini & Debant. Calf and kip skins tanned and prepared by the old French process, which is claimed to produce the best leather yet manufactured. They only commenced business last January, but have already turned out $4,000 worth of stock.

P. Kelly. Three cases of ladies, gents and misses' boots and shoes. Mr. Kelly has obtained an enviable reputation as a manufacturer of the finer kinds of boots and shoes—no doubt well deserved. He commenced business in 1861 in a very limited manner, but by strict attention to all matters connected therewith, he now employs thirty hands, and the value of his finished work per annum reaches $50,000. Much of the stock used by Mr. Kelly has to be imported, but whatever leather manufactured in California that can be made available, is always used.

J. C. Johnson & Co. Harness leather, extra quality, and made expressly for them at Santa Cruz.

Main & Winchester. Make one of the finest displays in the line of saddlery, harness, etc., that has ever been seen in California. Harness, double and single, heavily gold and silver plated, American and Mexican saddles with trappings complete, fur robes, heavy woolen robes and blankets, rugs, whips, etc. This firm is the oldest and most extensive manufacturers of these goods on this coast. California leather is used almost exclusively.

John F. Snow. Blankets, woolen goods, furs, gloves, etc., cleaned or dyed in a manner that makes them appear equal to new.

Angora Robe and Glove Co. Made a very fine exhibit of Angora goat skins prepared for rugs or foot mats. The tanning and coloring was of the highest order, and they would add to the appearance of any room. This industry is a new one on this coast (that is to manufacture in large quantities), and must ultimately be very successful, as the demand will always be great, and the raw material abundant, as the Angora goat thrives and increases wonderfully in this State.

H. Behrendt & Co. Trunks, valises and traveling equipage. This was a fine display of samples from the large stock of this well known manufacturing firm. Some for ladies were particularly noticeable, as containing many new devices for their convenience. Their sole leather traveling trunks would defy the most malignant baggage man. We have no statistics of the extent of their manufactures.

Levi Strauss & Co. Patented riveted clothing; also, the process and method of its manufacture. This was an interesting feature of the exhibition, and constantly surrounded by an interested crowd.

This clothing is a great boon to the working man who wears overalls or overshirts. The quality of the materials used is of the best, and sewed with three parallel rows of stitches for every seam. Particular attention and care are also used in fastening on the buttons. The principal point, however, is the rivet, generally of copper, that is inserted wherever great strain comes, and which positively prevents any ripping of the parts. Messrs. Strauss & Co. are now sending their goods to all the principal cities of the Union, and are commencing the manufacture in many of them also. In Philadelphia they already have an establishment running. They have been at great expense to protect their patents, but have every time been successful, and are now reaping the benefit of their ingenuity and energy.

Joseph Bros. Boys' clothing, well made, stylish cut and finish.

Lancaster & Northon. Gent's suits cut and made in the latest style, from diagonals, Scotch tweed and French cassimeres. Good to look at, and no doubt would fit and wear well.

Poheim & Lancaster. Gent's clothing. Several forms made of wire, and dressed up in this firm's stylish suits. Were it not for the lack of heads, would have looked like some of our wealthy citizens or managers of the Fair, with their best clothes on.

P. Beamish. Had a large show case filled with an elegant display of gent's furnishing goods, consisting of fine white shirts, flannel underwear, socks, handkerchiefs, neckties, etc., mostly manufactured at his establishment.

C. M. Plum & Co. Carpeting, Axminster Tapestry, Moquet, Turkish,

Brussels and Velvet; also, window upholstery, rugs, and draperies. Recent importations and new styles. (See Div. 4.)

Bell, Gullixon & Co. Carpeting, Axminster, Velvet, Turkish, and Brussels; also, draperies for windows, rugs, etc. Three sections were arranged, showing parlor, dining room, and boudoir carpet, with appropriate furniture. (See Div. 4.)

Alexander Mackay. Domestic or rag carpet; rags and yarn. The following letter from Mr. Mackay, in relation to his business, we deem of interest:

"I commenced business in the fall of 1867. The number of my employees directly under my pay are from seven to nine persons; but my employees are numbered by hundreds, as you will see further on.

I use two materials in the production of my carpet; warp and filling. The warp I import from the East. I use about 7,000 lbs. per annum at a cost of about $2,500. It is a cotton twine not produced or manufactured on the Pacific Coast. The value of the filling is inconsiderable, as it is a waste product. I make up two kinds of carpet. The first quality, such as my exhibit at our last Fair, is made from the refuse of tailoring and clothing manufactures, termed List; it is worth from 6 to 12½ cents per pound. I buy about 5,000 pounds per annum. The next, or second quality, is the waste garments, etc., of the household, worth 1½ to 2 cents. Of this quality, I consume about 30,000 pounds. When they come into my hands they are all cut and sewed ready for weaving, by the different families sending them as a rag. I don't buy a pound. They have a more intrinsic value than a commercial one.

The value of my productions is about $19,000 per annum.

My business is a specialty; peculiarly so to America. It is an American industry, practised by no other nation or people that I know of. It was first used by the early settlers of our country, who were noted for their skill in the application of all their resources to the adornment and comforts of their homes, with as little cost as possible. Here was born a rag carpet.

In the Eastern States every community has its rag carpet weaver. In the City of Philadelphia it is estimated that there is made from 750,000 to 1,000,000 yards per annum.

I was the first to commence its manufacture as above in this State, with one loom; now I have six looms, producing 20,000 yards per annum. Others have started in various parts of the State until, at this writing, I have the address of thirty-seven different parties engaged in the business, and thus it will increase until every community has a rag carpet weaver.

The mode of preparing rags is simply the cutting up of all waste, worn out garments or materials into strips of about ⅜ to ¾ of an inch wide, and sewing them together into a continuous thread, and winding them up into balls (this is is all done in the family circle), sending them to the weaver, who supplies the warp. Some of these carpets are marvels of skill and patient industry. I have just finished two, made up as follows: from sixty pounds of rags from each party, making one forty, the other forty-five yards. The rags were cut into strips about three-eighths to three-quarters of an inch wide,

each strip averaging in length less than eighteen inches by calculation. I make not less than 15,000 different pieces of cloth in each carpet. These rags were all old material, except a few pounds of colors, some of which were dyed by the parties themselves, and all were prepared within the family circle, and is a fair sample of rags sent to me. So that my employees are not numbered by those on my pay roll; but that I have employees in a double sense, who work for themselves, and supply me with work at the same time.

My business is mostly a country business; the thrifty and industrious only are my patrons."

F. Knewing & Co. Patent English eider down goods, consisting of down quilts, dressing gowns, sofa pillows, ladies down vests, skirts, and dress improvers. All down goods in Turkey chintz can be washed without the down being removed, as the washing improves the down and renews it. The down is prepared by a patent process, and is entirely free from all effluvium. The medical testimony in favor of these goods is very strong, from the fact of their being extremely light, and at the same time retaining the necessary warmth for the body.

Jacob Unna. Feather dusters and plumes. This fine exhibit of a new and a home industry is deserving of much praise, the style and quality being equal to the best imported. Mr. Unna commenced their manufacture in 1872, and at present employs about fifteen hands. The value of the raw material used and all produced here is about $20,000 per annum, while the finished products amount to $40,000.

A. J. Balny. Case of most beautiful ostrich plumes for millinery purposes, in all colors.

Mrs. I. Ash. Furs sewed and dyed. Mrs. Ash makes a specialty of this kind of work. A kind of patch work fur robe in her exhibit showed a wonderful skill with the needle.

Mrs. J. P. Murray. An elegant hand made afghan.

Embroidery, Crochet, and Worsted Work. There was not a very extensive display this year of the above work, no inducement in the way of premiums being given. Yet it was creditable, and its general excellence remarked upon by visitors. (For list of exhibitors see catalogue of exhibits and Division IX.)

Mrs. Sullivan. Stamps and patterns for embroidery in great variety, some new and of most elaborate designs.

Mrs. H. Stettin. Stamps and designs for needlework and embroidery, particularly in monograms and letters.

Mrs. Davison. Hair work (bouquet of flowers.)

Mr. M. V. Kendall. Hair work.

Miss R. Eppler. Hair work, jewelry, etc. This exhibitor had her frame and braiding apparatus at the Fair, and patiently wrought, day by day, the beautiful articles that showed such wonderful handiwork and cunning device.

Californa Silk Manufacturing Co. Sewing, embroidery, and skein silk of every shade and color, all manufactured at their works in this city. They also exhibited in operation a silk braiding and spooling machine. We regret that no statistics of this to be important industry of our State was furnished us.

San Francisco Journal of Commerce. Exhibited samples of wool, beeswax, honey, leather, and other animal products of this State. (See Dlv. 9.)

Theodore Hermann & Co. A fine conchological collection, marine curiosities, and bird skins. A large portion of the shells were collected in Lower California, some being of great beauty and value,

Woodward's Gardens, under the supervision of Mr. Chas. Stevens, made a most beautiful scientific and instructive display in natural history, comprising over 325 specimens, all labeled with their common and scientific names, and the different orders grouped together. (For a list of the collection see catalogue of exhibits.)

E. F. Lorquin. One hundred carefully prepared and numbered specimens of birds, animals and reptiles, all fine specimens of the Taxidermist's art.

S. Foster & Co. Condensed eggs. This new article, recently placed upon the market, consists simply of fresh-laid hens' eggs, from which the water has been evaporated, and being hermetically sealed, remain perfectly sound.

Juan A. Robinson & Sons; Rodgers, Meyer & Co., Agents. Fresh green turtle in 1 lb. and 2½ lbs. tins. The factory of this important industry is located at Guaymas, Mexico, and was established in 1873. They employ thirty-five or forty men constantly. The present production is 1,500 cases per year, valued at $30,000. The turtle used is obtained principally from the Gulf of California. Specialty consists in so preparing fresh green turtle and packing it in such a manner as to preserve it fresh and good for an indefinite length of time, and in any climate; many attempts having been made by other parties, who have universally lost their time and money in the endeavor, until this method was discovered, which

has proved to be an undoubted success, which method is secured to them by Letters Patent from the United States Government and from the Republic of Mexico. They are now prepared to supply the world with this delicate article.

Astoria Fishing Co., Columbia River, Oregon. Canned salmon.

Cutting & Co. Canned salmon.

W. T. Coleman & Co. Canned salmon.

C. Adolphe Low & Co. Canned salmon.

Fitzpatrick, Davis & Co., Fisherton, W. T. Canned salmon.

All the above made small exhibits of salmon prepared and put up in tins for use. We have no statistics of the business done by the above firms, but they represent the principal shippers and packers of that article on this coast, and the delicacy can now be found in almost every city in the world.

C. James King of Wm. & Co. Canned preserved meats. An immense amount of flesh, fish and fowl is annually prepared in hermetically sealed cans by this firm. Also fruits, etc., for which see Division 8.

DIVISION IV.

Lumber and Manufactures Wholly or Partly in Lumber.

The Pacific Coast as a whole is emphatically a region of woods. Doubtless it does not exceed in that respect what parts of the world, say Europe, have been in the far distant, but to-day it is with the exception of South America and its vast Brazilian forest, the Silvas of the Maranon, the greatest forest region on earth. Beginning almost with the Isthmus of Panama, and following the backbone of the Continent, the Sierra Madre or Mother Range, until they branch out into the Rocky Mountains and the Sierra Nevada Ranges, and following these and the closely related parallel chains or spurs till they dip deep beneath the waters of the Arctic Ocean, we find a continuous range of woodlands in places the greatest and the densest on the earth. The extent of this vast forest, or rather succession of forests, is truly immense. The quantity of lumber contained is estimated at four millions of millions of feet. At this vast supply we have been nibbling away for a quarter of a century, and

when another quarter of a century shall have passed away, we shall be but nibbling yet. During this quarter of a century there has been manufactured upwards of 7,000,000,000 feet, valued at $70,000,000. The receipts last year in this city equalled 306,000,000 feet; of which 163,695,426 was Pine; 109,111,365 redwood; 7,730,400 cedar, 3,000,000 feet sugar pine, and the balance a variety of other woods. Of this, about 10,000,000 feet were exported; the balance was used for building purposes and in the various manufactures carried on in the city. An average valuation per thousand would make the whole worth $3,000,000 when cut. The product of the whole State equalled 440,000,000, while the product of the coast for the year may be estimated at 700,000,000, worth $7,000,000 at the mills.

In a consideration of the manufactures in lumber, whether as exhibited or existing in the city or on the coast, ship building would naturally take the premier rank. As yet, however, ship building on this coast is but in its infancy. Notwithstanding that we will pay to five or six hundred vessels, foreign or Eastern, the large sum of eleven or twelve millions of dollars for carrying our surplus wheat crop to Great Britain, and that we have paid a proportionally large sum in years past, ship building as an industry is at a very low ebb amongst us. About a year ago there was a great deal of noise made about a ship building company, which was to build ships for the world on our coast, but that is the last that was ever heard of it. Viewed from that standpoint, therefore, the exhibit of models of ships and ship yards made by three exhibitors becomes of interest; but their display is more one of what may be done in these days in naval architecture, than one of what has been accomplished. We have built a large number of small coasting crafts, but so far as we remember, the Wildwood and the Western Shore are the only two large sea-going vessels that have ever been built on the coast. The success attending them shows what may be done in this direction. Built of Oregon fir and cedar, A No. 1, as well built as of oak, they only cost $65,000 each, and would earn on their first trip at least $22,000 apiece in the gross. We can afford to build lots of vessels like these two, and be so much the richer by the operation. The money spent for freight would then be spent at home, instead of as it now is, sent abroad every year.

In this city the aggregate value of the manufactures either wholly or partly in lumber, may be given at $8,000,000; of which the furniture industry is by far the greatest and most important, employing from four to five hundred hands, and aggregating $2,000,000 in value of products. A few years ago it was almost unknown in San Francisco, and most of our furniture was imported from the East; but it is now different. The perfection attained in it could only have been realized by an inspection of the gorgeous chamber and parlor sets shown in the gallery of the Pavilion. One could never weary looking at them; some of them being fit for the palace of an emperor. That such superb furniture should be made here, is illustrative of the skill and enterprise of our manufacturers; that it should find purchasers, is illustrative of the wealth of our citizens. The only drawback that we have had in this respect has been the necessity imposed of drawing our supplies of black walnut, etc., from the

East, but that need not longer remain an obstacle, for it has been conclusively proved that hard and ornamental woods of a somewhat different description, and when polished of the greatest beauty imaginable, are found on the Pacific Coast and on its islands.

Coaches, carriages, etc., though partly made of leather, fall more naturally under the head of manufactures in lumber. The establishments devoted to this industry are many, but, with few exceptions, they are small. There is, however, a mammoth one, which has sometimes employed as many as two hundred hands. At present there are 370 hands employed in the whole industry, and the annual value of its products will reach $1,350,000. In this class of manufactures the fair has been particularly fortunate, quite a large number having entered for competition, as to merits, before that great arbiter, the public. The result is most favorable, as all the workmanship is splendid, and as it is probably only in the style that a difference may be found. This is a city of wealth, and more keep their private carriages, their Clarences, Broughams, etc., than ever. The city is noted for its work in this line in other directions, in street car and railroad work particularly, and none who have visited can easily forget the magnificence of the Kimball Palace car, composed of twenty different kinds of wood, which was, unfortunately, burnt in the great fire at Chicago. Outside of this city the industry has attained some prominence, and the car workshops of the Central Pacific, at Sacramento, are in themselves marvels.

Out of all the box factories in the city, but one exhibited at the fair, and this one not at all as the importance of the object demanded. The state of this business is a type of the state of that of almost every other; for when things are brisk there is a demand for packing boxes by all classes, and when it is dull the demand is dull, and it has, according to our experience, always been so. Judging by such a standard, the past year had not been exceptionally well off, as most of all those spoken to seem to say that there was nothing to justify placing a rose color appearance upon things at present, anyhow. The descriptions made are almost innumerable, and embrace all kinds, from the small drug box of the druggist to the gigantic packing of the furniture manufactories. In good years about three hundred are employed at the business, the value of which labor does not fall far short of a million of dollars.

In the door, sash and blind factories, in favorable seasons, there are over 600 men employed, the value of whose labor annually exceeds $1,600,000. This important industry has been altogether unrepresented this year, and has, in fact, never been represented, that we know of. Yet it is a most worthy one, for it supplies not only this city and a good deal of this coast with the indispensable article, but it also exports them to far distant countries, to Mexico, British Columbia, the Sandwich Islands, China, Japan, and Australia. In all these places our work is sought for and commanded; it is passing strange, therefore, that it is not represented in a public industrial exhibition, in its own centre and seat. The material is amongst the most durable in the world.

Amongst manufactures of minor importance, that of picture frames, whose prosperity has ebbs and flows corresponding to those in business, at first astonishes by its magnitude. It is not less than half a million dollars per annum, and includes quite a large and important number of establishments. This is entirely unrepresented also, though it is carried to a high state of perfection in this city. Owing to the wealth and luxury of San Francisco, and the desire of its people to have the best of everything, picture frames of most gorgeous styles and patterns, and magnificently mounted mirrors are the order of the day, and it has long since become more profitable to manufacture them here rather than to import them. An exhibit of this kind could not fail to form one of the most interesting features of any future fair.

Judging of the magnitude of our glue and other interests, we would have thought that the manufacture of sugar, butter, and beer casks or kegs would form an important item in our industrial economy. And so it does, and it it is one the extent and value of which is increasing every day. During the past four years it has made gigantic strides, to correspond, in particular, with the equally gigantic strides made by the wine interest of the State, which has advanced in a heavy rate. In part the industry has been well represented; that is, in that part relating to the wine interest. Two different firms showed what they could do in this way, and placed in the fair two mighty wine casks, one of the dimensions of 3,000 gallons, the other of the dimensions of 4,000 gallons, of stout and well seasoned lumber, and fit to grace the oldest of the wine cellars of the Rhine. And though hardly coming in here, we may mention the exhibit by a barrel, keg, etc., factory, of old standing, of samples of the now celebrated paper barrel, which are light, durable and elastic, and admirably adapted for the purposes for which they were destined, much more so than packages of any other kind. They are now largely used for the shipment of flour from this city to China, Japan, and indeed all over the world. The total value of the industry in this line exceeds annually the sum of $400,000.

The match makers of the city were not represented this year, though their representation, when it will be made, will have more of utility than of beauty. It is, however, growing very important, and deserves special mention, more particularly as it has succeeded almost entirely in ousting foreign and Eastern matches entirely from this market, and as it has been exporting to all the islands of the Pacific for a considerable period. Its annual value fully equals $350,000.

The fine show of trunks made by the pioneer trunk makers of the city naturally calls attention to this branch of our manufactures. It is only classed with manufactures in wood for the sake of convenience, many species of trunks being more truly manufactured in leather than in wood. However, on account of the composite character, this classification will do as well as any other. Trunk making ought to be of considerable importance in a city like San Francisco, and it has in effect grown greater in importance during the past few year. At present it gives employment to the energies of five considerable firms. The value of trunks made is about $230,000 annually.

Where the game of billiards is so universally followed as it is in California, it would be surprising if there were not billiard factories. And there are several well appointed establishments in this city, some of which were represented at the Exhibition during the past year. Some of the billiard factories of the city are as noted for the work turned out of them as those of any part of the world. Costly and *recherche* woods are used in their manufacture; sometimes of home, sometimes of Eastern or foreign growth. Amongst the former, is the California laurel; used principally for veneers, and susceptible of a very high polish. The workmanship of some of these tables equals anything to be found in the world, and reflect the highest credit on the art and skill of California artisans. If only for the artistic perfection in design and workmanship, and their delicacy of execution and finish, it would be to the interest of the manufacturers and the craftsmen of the city to have them on exhibition. Of the former, because of the reputation gained by such work; of the latter, because they afford a useful field of study for those who work in articles of utility, to be able to add also grace and ornament. California billiard tables are known far beyond the limits of the State and of the coast; that is, the Pacific Coast of the United States. They are used in British Columbia, and in the Territories, and have been shipped to Honolulu, Mexico, Japan, China, etc., and also to Australia. The value of the manufacture in the city approaches $200,000.

Of all the exhibits on the main floor of the Pavilion, among the finest undoubtedly were the two of wooden-ware. There, covering a large space, might be seen tubs, pails, ice cream freezers, etc.; the manufactures of two of our largest factories. They are very creditable in appearance indeed; sound and serviceable looking, and calculated to give strangers a very high idea of the lumber manufactures of the coast. Pretty nearly all the wooden-ware is manufactured of Pacific Coast material—the industry then is in a peculiar manner one of the representative ones of the coast. It has advanced with rapid strides during late years, and though wooden-ware is imported occasionally, it is only occasionally, all that is used on this coast being mostly made here. The industry supports two large factories that find a constant demand for their goods all over the coast, and in Mexico, British Columbia, and the Sandwich Islands as well. At the present time the industry is worth $200,000 a year, and its value is rapidly increasing.

Brush-ware was next, not in order of importance, but in order of association. It is a small industry, but rapidly growing. It is now worth about $60,000 a year. It was fairly represented by a couple of establishments, the variety of whose ware was almost infinite as are the uses of the article.

A couple of wood-turning lathes present, served to remind the spectator of the turned and carved work of San Francisco, which otherwise was unrepresented. This industry, which may be valued at $150,000 annually, has now assumed great importance, and from a practical as well as an artistic point of view, is of considerable moment to our manufactures. Some of the pieces of work turned out and done by hand in San Francisco, could not be excelled in America. It is of the most elaborate and richest description, and without the

aid of the cunning craftsmen who carry it on, some of the finer work done in other industries could not be turned out. Within the past year or two, a good deal of it has been done by machinery; a machine having been imported which from a pattern will produce any number of copies of the most difficult and delicate piece of turning, and that with a mathematical exactness.

Several beautiful examples of polished and carved stair work have been shown in the Exhibition, and have attracted more than usual notice. Owing to the rapidity with which the work of building up the city has been carried on, this has become of more than usual importance, and now taxes the energies of several large establisnments which have developed particularly during the past three or four years. In the splendid private residences that during that period have been built all over the city, stairways of the most elaborate construction and the finest material have been in demand, and the demand has called into being a prosperous industry to supply it. At least $150,000 worth of stairs were made last year by the firms engaged in the business.

Last making is important in a city where the manufacture of boots and shoes is so largely carried on. There are two prominent firms engaged in it, both of which find enough to do to keep the various factories supplied. They turned out $30,000 worth last year, and will no doubt do the same this year. None of them put in an appearance in the Pavilion this year, although they have done so the years before.

Three different descriptions of windmills were on exhibition. The number of windmills patented during the past few years is something enormous, and every year some one is coming forward with a new one, which never amounts to much. Windmills are a great necessity in California, and there exists great competition between the makers of them. The value of those made in this city last year is estimated at $50,000.

There are many other descriptions of manufactures in wood that are carried on in the city to a greater or less extent, and that are represented more or less completely at the Exhibition, but we have given those of any moment.

EXHIBITS IN DIVISION IV.

B. H. Freeman & Co. Newel posts, balusters, rails, specimens of polished woods, etc. This exhibit attracted much attention, particularly the newel posts, which, for design, superior workmanship, and high finish, would be difficult to equal, and almost impossible to excel. Over forty varieties of wood, mostly of the Pacific Coast, were used in making up the display.

Sanborn & Byrne. Stair work, newels, balusters, etc. Though not as large as the other exhibit, still the work gave evidence of high order of workmanship. Some of the designs were new and original. One was a newel post in black walnut, fluted and carved, and surmounted with ornamental bronze gas burner. Another of the same material, with sunk panel and baluster to match, was very pretty.

H. M. Black & Co. Carriages.

Carvill Manufacturing Co. Carriages.

B. Gallagher. Carriages.

Larkins & Co. Carriages.

Paul Friedhoffer. Carriages.

The above exhibits of carriages were all of home manufacture, and reflect the highest credit on the proprietors and workmen of the factories that produce such well made and elegant specimens of the carriage builders' art. The last statistics show that in this city there are four hundred men constantly engaged in the manufacture of carriages, cars and wagons, while the aggregate value of the finished articles per annum is $837,000.

Holcomb Bros. & Co. Carriages (imported.)

Crego & Bowley. Carriages (imported.)

Both the above exhibitors showed good taste and judgment in the arrangement and selection of their displays.

E. Steele. The Oppenheim buggy, containing a new and patented device for changing it from a single to a double seated buggy. This arrangement has been thoroughly tested during the past year, and has proved very effective and convenient. The device is simple, not liable to get out of order, and neat in appearance.

M. McCue. Butcher wagon.

J. Walton. Milk wagon.

Both the above wagons were made here. Strong and adapted to the purposes required.

T. H. King & Co. Wagon materials, both of wood and iron. A comprehensive assortment from their extensive establishment.

Meeker, James & Co. Materials of every kind used in the construction of vehicles, including wheels.

Duval & Sanborn. Duval's patent wheels for wagons and carriages. The wheel has no wood about it save the rim and felloes. The hub is composed first of a cast iron box, having a flange on either side the centre, a short distance from the ends. Upon these flanges is shrunken a broad iron band of wrought iron of thickness proportioned to the size of the wheel, the band being wide enough to project past the flanges an inch or two. The spokes are composed of round iron rods without shoulders, passing through this iron band and fastened with a nut inside, and the outer end passing through the rim and tire and riveted. The spokes are set bracing, alternately passing to the inner and outer end of the hub, the wheel having no "dish." A cap then screws on each end of the hub, that closes in the nuts and finishes

the wheel up to look like an ordinary wheel. The wheel being all iron but the rim, there is no rotting, shrinking, swelling, nor any chance for springing spokes.

J. M. Lawrence. Standard platform spring wagon.

Frank Brothers & Co. The "La Belle" farm wagon.

Linforth, Kellogg & Co. Fish Bros.' wagons, of various styles.

M. C. Hawley & Co. The "Schuttler" farm wagon.

The above are all imported wagons, made specially for this coast, with the latest and best improvements in bodies and running gear.

E. K. Howes & Co. Wooden ware in great variety, for farm, household and dairy purposes, all home manufactured and from native woods, of which they annually consume about 2,000 cords of bolts, comprising cedar from Puget Sound and Truckee, sugar pine, redwood, spruce, cottonwood, alder, maple, ash and fir. The firm employs about forty men and has the most improved machinery. One specialty of their manufacture exhibited, is the Eureka refrigerator, which is claimed to surpass all others in usefulness and economy. They were elegantly made and finished, and in appearance would not disgrace the finest dining room. For elegance, usefulness, and good workmanship, their exhibit of wooden ware was never before equaled on this coast.

Armes & Dallam. Made an extensive display of wooden ware of their manufacture, comprising over one hundred different varieties of articles. Their goods were not so elegantly finished as those of their competitor, yet they were well made and adapted for the purposes required. They have an extensive factory here, but we have no statistics of the amount of their manufactures.

Gillespie, Zan & Co., of the Eureka Broom Factory. Made a fine display of brooms and brushes. A specialty with them is the socket broom, or a broom with a detachable handle, which housewives claim is very convenient and serviceable at times. When an ordinary broom wears out the handle is thrown away with the broom, but with these one good handle will last a life time. The raw materials used are all obtained on this coast.

West Coast Furniture Co. This company exhibited parlor, dining room and bed room furniture, the parlor and bedroom being samples of sets manufactured for Baldwin's new hotel. Much of their work is made from native woods, and it is to this company that credit is due for the introduction and general use of the valuable, beautiful, but unused woods of our State. The immense quantity of furniture manufactured for and placed in the Palace Hotel by them, all of new and unique designs and of Pacific Coast materials has demonstrated to the world their value and beauty. They also exhibited

the manufacture of splint baskets and chair seats, with the new and improved machinery for that purpose, invented by A. F. Scow of this city, several operators being at work every evening.

J. P. Goodwin & Co. As heretofore, made a large and fine exhibit of furniture, principally manufactured by them. Their display was taken from their general stock, and not gotten up specially for this exhibit, but of the goods of which any number of duplicates remain at the store. The firm was started here as early as 1852, and at present employ on an average eighty-five men, exclusive of salesmen, packers and porters. The value of the raw material used per annum is about $125,000, of which fully two-thirds is produced here. The value of their finished products the past year was $320,000. Their manufactures includes bedding and upholstery. Their workshops are always open for inspection by purchasers, where they can see the quality of the materials used, and the scrupulous care of the workmen.

C. M. Plum & Co. Ebony and gilt French cabinets, walnut hall stands, parlor sets in satin and gilt, and beautiful upholstered work.

Bell, Gullixon & Co. Furniture for the parlor, dining-room and boudoir; all of artistic design and high finish.

California Furniture Company. Had three rooms, viz.: parlor, library and bed-room, fitted up with furniture, carpets and window hangings complete. This beautiful display of their manufactures attracted much attention by the good taste and harmony observed throughout. This company is one of the most extensive manufacturing concerns on this coast.

Hoey & Taylor. Some very fine furniture, but their principal display was of Hoey's improved sofa-bed, that seems to meet all the requirements needed in such an article. Pleasing in appearance, upholstered with best material, and strongly made, it received universal praise from visitors.

B. C. Brown. Norton's patent cabinet secretary and rotary desk, made at Indianapolis, Indiana. This desk has justly obtained a popularity among business men heretofore unprecedented in the way of desks. It seems that ingenuity could go no farther in devising an article that should contain all the requirements needed for writing and storing of books and papers. The exterior style and finish also commends it, and hardly any room could be furnished so well but what one of these desks might appropriately be placed there. Mr. Brown has commenced their manufacture here, and intends using, where practicable, our beautiful California woods in their construction, which will add to their intrinsic, if not their real value.

Gilbert & Moore. Made a fine exhibit of office and school furniture and settees of their manufacture. A most creditable display of one of our home industries. Also the St. Louis woven wire mattress.

E. A. Hubbard & Co. Office and school furniture, consisting of "roll" and school desks, office tables and chairs, book rests, etc.; also, R. E. Dietz's tubular lanterns, and the Shaler gas machine.

A. Roman & Co. School furniture, suitable for all purposes of the school-room. (See Sec. 9.)

A. L. Bancroft & Co. School furniture of the most improved patterns for health, comfort and convenience. (See Sec. 9.)

N. B. Childs. School furniture, good and substantial.

Benjamin Pollard. Invalid spring bed. By the ingenious mechanism of this bed, which is applicable to any hospital or family bedstead, a patient may be raised up in bed to a sitting position, turned upon either side, stood upon their feet, or lifted entirely up from the bed, being suspended in a horizontal position in the sheet, giving an opportunity to change mattress or the bed clothing without touching a hand to the patient. So easily are the changes made that a patient in an ordinary sleep would not be roused from his slumber. The mechanism of this bed is so simple that a child twelve years of age may perform all the offices necessary in its adjustment for the sick. It is highly indorsed by the medical fraternity.

J. A. Biggers. Improved sofa bed of his invention and manufacture. Looks well as a sofa, and makes a comfortable bed.

M. T. Brady. Bed lounge, inviting in appearance, and a very convenient article of furniture.

J. Gray & Co. Star spring bed. These beds are made from steel wire and contain one hundred and forty steel springs. The springs are united diagonally by a four-armed wire clamp, and the whole so arranged that pressure applied upon any one portion of the surface of the bed is equally distributed and sustained by all the springs. Another excellent feature is that both sides of the bed are alike; it can be used either side up, has no attached frame of wood or slats, but is soft, flexible, and yielding in every point. The business of manufacturing these beds commenced in 1875. Five men are employed and use per annum raw material to the amount of $11,000. The manufactured products amount to $20,000.

Clark, Rickoff & Co. The improved Crandall spring bed, composed of double or twin springs, riveted upon a framework of cedar slats, which in turn rest upon another tier of heavy springs, thus producing action and reaction. They require no tying, and support every part of the body equally. The slats being made of cedar are obnoxious to vermin or moths, and the mattress being only laid loosely on the springs can be taken off for airing, while the bed is always clean.

They also manufacture a patent wool mattress, the wool being cleaned by a process whereby all the crude animal matter is extracted. As wool is a good non-conductor of heat and cold, it is claimed these mattresses in some respects are better than hair, and much cheaper. Their business was commenced in 1873. The amount of raw material used per annum is about $13,000, the average number of employees ten. The value of the finished articles per year is $36,000.

A. Nachman. Champion spring mattress.

T. S. Clark & Co. Union wire mattresses, iron bedsteads and lounges with the wire mattresses attached. The mattresses and iron work used by them at present are imported, but the fittings, etc., are done here. Their entire manufacture will soon be commenced in this city. The wire used is of the best galvanized steel. It is claimed that with careful usage these beds will last a life-time.

P. Liesenfeld. Billiard, pool and bagatelle tables, fitted up with Phelan & Collender's American standard cushions; also, racks, cues, balls, etc. Mr. Liesenfeld has been manufacturing these billiard tables in this city for twenty years, and has always enjoyed an enviable reputation for excellence of workmanship and for elegance of ornamentation. Indeed, the use of our handsome Pacific coast woods gives him an advantage over Eastern manufacturers to whom these woods are not available. His business was commenced in 1856, and the average number of employees at present is twenty-one. The value of raw materials used per annum is $20,000, mostly obtained on this coast. The finished articles for the same time amount to from thirty to forty thousand dollars.

Geo. W. Swan & Co. Wooden boxes of all kinds. This exhibit of boxes was the best ever made in this city. This extensive factory employs on the average one hundred men, and using up per annum $65,000 worth of lumber and $10,000 worth of hardware. The value of the finished boxes per annum is $50,000. The wood for all the boxes is put into a hot chemical preparation, in which it is boiled like a potato. This is a device of Mr. Swan's, and it makes the wood more pliable and not so apt to split when nailed, although it is just as strong as before. It is softened so as to cut easily.

For light boxes the wood is made up into "cut stuff." The knife by which it is cut is in the form of a huge guillotine, with a blade 12 feet long. This knife has a lateral as well as vertical motion, and has the effect of shaving off pieces of the required thickness from the blocks, without causing any loss in sawdust. The feed which brings the block under the knife is an invention of Mr. Swan's, as are the other parts of the machine. This process is much more rapid and efficient than that of sawing. Besides preparing wood for boxes this machine makes "cut stuff" for picture and mirror backs, etc. Formerly from $20,000 to $30,000 worth of this used to be imported, but now it is all made here.

A very important operation is also performed during the operation of cutting, in making thin boxes of various kinds. This is the "scoring" process. Scoring is done by cutting crosswise the fibre and about half-way through where the corner of the box comes. The wood cut in this manner is made up into fruit and berry boxes, lard and vegetable caddies, spice boxes, candy boxes, collar and band boxes, patent medicine boxes, etc. For fruit boxes for holding berries, etc., they are very valuable, as the wood ready sawed is sold to farmers and others who can make up the boxes themselves. In this way the material for a thousand boxes does not occupy as much space as a hundred after they are made up, causing a very great saving in transportation.

The boxes when covered with paper look exactly like pasteboard, but are stiffer, stronger, and more durable. Most of these boxes are made to order, and some of them are handsomely ornamented, those being made for the holidays particularly. These are entirely new articles of manufacture among us, and the demand for them alone is almost enough to keep the factory running. The cut stuff is shaved off in widths varying from forty to the inch up one-quarter inch, according to the style of box to be made. Almost every package formerly made of pasteboard is now made up in this manner.

In addition to these articles the factory turns out bacon boxes, butter boxes, coin boxes, large fruit packages, and in fact, every kind of box imaginable, as shown in these exhibits. Some of the packages for lard, coffee, fruit, etc., are water-tight, being lined with a "loricator" or water-proof shellac of Mr. Swan's invention. The coin boxes and those for heavier articles are dovetailed.

Another useful device used by them, and its work exhibited, is the branding and printing of names on wood. If a manufacturer orders a number of boxes for any particular purpose, his name and address are printed on the box for him, with much less trouble than they can be by stencil plate. The letters are raised, and by powerful machinery forced into the wood to any depth desired. The letters being inked, the color is transferred to the wood, and being below the surface, never wears off.

Fulda Brothers & Co. Mammoth wine cask of 3,200 gallons capacity. This fine specimen of cooperage is but a specimen of the many turned out from their extensive manufactory, which is supplied with all the most approved machinery available for the work. They started in 1865, and employ at present twenty-five men. The materials for large casks are all imported, although California woods are largely used for wine, liquor and water tanks. Their manufactures last year amounted to $75,000.

David Woerner. Wine cask 11 feet 9 inches high, 9 feet wide, and 8 feet 2 inches in length, being elliptic in shape. Its capacity was 3,500 gallons. Mr. Woerner makes a specialty of these casks (used for wine), and this was but one of several made to order. All his work is hand made, no machinery being used.

S. Gray. Model of a twin staircase and elevator. The stairs are winding and in the "well" the elevator is worked by four screws running through it

from top to bottom of the building. Absolute safety is obtained by the device, but its practicability remains to be demonstrated.

J. Hendrickson. Inlaid cabinets. They were only models, but complete in every particular, and beautiful specimens of the cabinetmakers' art.

Stockton & Edwards. Exhibit rustic table and chairs, and an excellent step-ladder, the main supports of which are composed of three rods of about an inch in diameter, which pass through each end of the steps, and which are fastened upon them with screws. Also ornamental fence of neat and tasteful design.

Dr. Moore. Improved family bath apparatus for giving steam, vapor or medicated baths. It is neat in appearance, somewhat resembling a sideboard without the top shelves, and no doubt a useful article in sickness. The heat is supplied by a spirit lamp.

Geo. McIntyre. Improved kitchen combination safe. This is not only arranged for holding articles of cooking, but is also provided with drawers and shelves for containing napkins, towels, cutlery and other articles which are used in and about a kitchen and dining room.

W. S. Moses. Patent "tilting" drawers is the title of his exhibit and invention, but in reality is only a part of an ordinary pastry bureau, the drawers being supported on a pivot near the centre of gravity; a slight pressure tips them forward so their contents may be reached. It is an improvement in drawers for the above purposes.

T. G. Hanzche. Model of a two-story house; exterior, interior, furniture, carpets, etc., finished and complete. Very ingenious and a waste of time.

Pilbeam & Henderson. Patent window blind. The patent consists of a new device for opening and closing the slats of inside blinds. The one on exhibition worked well, and has been adopted in some of our finest dwellings.

E. Hook. Patent kitchen tables, "household treasure," arranged with drawers for flour, meal, spices, knives and spoons, and the kneading board; an article that housewives will probably appreciate.

Rupley & Parker. Japanese cabinets, tables, chairs, boxes and curios, all made with great skill and quaint device. The Japanese taste, however, in the arranging and inlaying of wood, is not good, and we presume that our ideas of ornamentation will be adopted ere long, as have been those of a more practical nature.

C. Leonard. Rope and spiral mouldings of various patterns and sizes. These mouldings are made on a new and ingenious machine invented in this

city, and their use and adoption gives a new and very pretty finish to many objects in architectural and cabinet work.

Albert G. Nye. Frames for moss work, hair or wreaths. These frames were in every way fine specimens of a manufacture that Mr. Nye makes a specialty of.

Louis Dampf. "Passe Partouts" in great variety and different styles. Mr. Dampf has practically secured the trade of these articles in this city by keeping on hand and manufacturing to order, any style or size required. The specimens shown were first-class in every respect.

Dr. A. M. Loryea. Turkish Kiosk. This was a most elaborate piece of Eastern architecture, and made to exhibit the articles and materials used in the Hammam baths of this city.

Jacob Zech. Square pianos, California manufacture. Mr. Zech is the pioneer maker of pianos in this city. All his instruments are built in the most careful manner, many of our beautiful native woods entering largely into the composition of the exteriors. He has received many awards for their excellence.

C. R. Hall. Upright pianos, California manufacture. These pianos were of good tone and finish, and compared most favorably with imported instruments. Mr. Hall has built up quite an extensive and constantly increasing business.

C. Boerner. Upright piano, of his manufacture, and containing some patented improvements invented by him, and claimed to be of utility.

Sherman & Hyde. "Weber" pianos, "Standard" organs, musical instruments and furniture.

Charles S. Eaton. "Hazleton" pianos, "Cottage" organs, and musical furniture.

James S. Smith. "Guild" pianos, "Jubilee" organs, stools, music racks, etc.

Wm. G. Badger. "Hallett & Davis" pianos, "Geo. Woods" organs, and musical furniture.

John Bergstrom. Church organ. This instrument is 26 feet high, 15 feet wide, and 12 feet deep; contains in its two manuals 15 full registers of 58 pipes each, or 870 pipes; and three registers of 27 pipes each in its pedals, making a total of 951 pipes. All the wooden pipes are of the finest Califor-

nia cedar; the metal pipes of pure tin and organ metal. The organ has 24 draw stops and two combination pedals, as follows:

GREAT ORGAN.

1—Open diapason, 8 feet tone, organ metal, 58 pipes.
2—Dulciana, 8 feet tone, pure tin, 58 pipes.
3—Melodia, 8 feet tone, wood, 58 pipes.
4—Octava, 4 feet tone, organ metal, 58 pipes.
5—Flute d'Amour, 4 feet tone, wood and metal, 58 pipes.
6—Twelfth, 3 feet tone, metal, 58 pipes.
7—Fifteenth, 2 feet tone, metal, 58 pipes.
8—Trumpet, 8 feet tone, reed with pure tin bells, 58 pipes.

SMALL ORGAN.

9—Open diapason, 8 feet tone, organ metal, 58 pipes.
10—Stop diapason, 8 feet tone, wood, 58 pipes.
11—Salicional, 8 feet tone, pure tin, 58 pipes.
12—Flute harmonique, 4 feet tone, pure tin, 58 pipes.
13—Figara, 4 feet tone, metal, 58 pipes.
14—Piccolo, 2 feet tone, metal, 58 pipes.
15—Oboe, 8 feet tone, reed, with pure tin bells, 58 pipes.

PEDALE.

16—Open diapason, 16 feet tone, wood, 27 pipes.
17—Bourdon, 16 feet tone, wood, 27 pipes.
18—Flute, 8 feet tone, wood, 27 pipes.

MECHANICAL.

19—Tremulant, acting on the entire swell organ.
20—Coupler, Small to Pedale.
21—Coupler, Great to Pedale.
22—Coupler, Small to Great.
23—Coupler, Small to Great at octaves.
24—Bellows Signal. Two combination pedals acting on the great organ.

The diapasons are built to a large scale throughout the instrument, and perfectly voiced, giving a strong and majestic foundation for the harmonies of the full organ. The solo stops are clear, sweet, and of well defined character. The action is built of the best material and according to the latest improvements in organs of this size.

Some of the best musicians in the State favored visitors at various times during the exhibition with grand performances on this organ, bringing forth

at their touch the wonderful harmonies and power of the instrument. Both players and visitors expressed unqualified praise of its action and power.

Mr. Bergstrom is deserving of much praise for his skill and knowledge in the manufacture, and enterprise in placing so costly and valuable an instrument in the pavilion. Churches, societies, or individuals wishing a good organ should consult with Mr. Bergstrom, and, if possible, patronize a home manufacture.

California Bellows Manufacturing Co. Exhibited one of their largest size blacksmiths' or forge bellows, which those conversant with the articles declared to be the best they had ever seen, both in construction, ease of blowing, power, and the arrangement of valves so as to give a steady stream of air.

C. D. Wheat. Patent wooden water-pipe for water or gas, which is a most remarkable illustration of the adaptation of wood for uses for which iron has generally hitherto been deemed indispensable. It is manufactured of the red fir of Puget Sound, one of the most durable kinds of timber, which on being tested by the Government officers of Mare Island, has been pronounced superior to oak. The timber of which the pipes are manufactured is that from the trunk below the limbs, and all portions containing sap are carefully discarded. The remaining portions of the trunk is then bored with the Wickoff Auger which leaves the core intact. The core is then bored for a smaller pipe. the one of this for another smaller again, and so on till the material is exhausted, By this method no material is wasted, and cheapness is secured in the manufacture which in no instance hitherto has been ever attained. It is then seasoned in a steam chamber and spirally banded, when it is ready for use. It has been introduced into Chico for gas and water purposes, and has proved itself quite equal to the best iron pipe ever used. Before being laid they are coated with asphaltum, which protects the outside, while the water or gas preserves it on the inside. Its advantage consists in its cheapness, the ease and rapidity with which it can be put down by unskilled labor, and tapped at any time or place by the same kind of labor. It also possesses the advantage over iron pipes of always giving forth a regular, undiminished stream of water as long as the sources do not give out; whereas, in the case of iron pipe the diminution in the flow caused by incrustations is such that in particular instances a 3-inch pipe laid ten years has become reduced in capacity to two inches, and a 6-inch main to five and four inches. The length of time that it will last unchanged is strikingly illustrated by a section of pipe used in the Elmira Water Works, New York, on exhibition here, which taken up after the expiration of fifteen years, seems as sound as the day when it was laid.

For irrigation, this would seem to be invaluable. The pipe may be laid below the reach of a plow, and tapped with an auger at any point and stopped up at pleasure.

The value of the finished pipe per annum is $60,000. Twenty men are constantly employed, and the value of the raw material used per year is $30,000, $20,000 of which is produced here.

T. Duffy. Rustic ware, consisting of chairs, settees, baskets, etc., all made from native woods and formed into many beautiful and tasteful designs, more especially adapted for gardens, lawns or conservatories.

P. Paulsen. Rustic furniture for gardens, lawns, etc.

J. J. Smith. Model of a shipyard, about one and a half by two feet square. This was a very ingenious piece of "whittling," it all being made with a jack knife, and showing a ship yard in all its details; a river or inlet of the sea runs through the centre, upon which is a fine full rigged vessel, sail boats, row boats and lighters. On the further bank a large ship is being built, apparently an old style man-of-war frigate, upon which the deck planking and sheathing has not yet been placed. Her huge ribs are plainly discernible, and men are busily engaged upon her in all the operations consequent upon such an enterprise. Oxen are hauling spars about; soldiers are tramping around on guard or walking with admiring maidens; sentry boxes, cottages and laborers' quarters are placed in proper and convenient positions.

Walter Hyde, Oakland. Hyde's Patent Swings. These swings consist of chairs suspended by ropes attached to each corner, the upper ends being fastened to rings and those placed on four hooks fastened to any suitable support. The ropes are so placed that by alternately pushing and pulling the two front ones by the hands the necessary leverage is acquired by which the momentum is gained. Hobby horses, as well as chairs, were hung up in this way. This invention is new, and commends itself for safety, ease and comfort. It is available alike to old and young, as an infant able to sit alone can operate it.

F. L. M. Peters. Improved baby jumpers, by whose assistance the weakest can "go it alone." Perhaps it would be well if this article was needed in every household.

John West. The "ladies' favorite" cutting, sewing and toilet table; can be folded up when not in use, and is a very convenient article.

Weister & Co. Wainscoting and flooring (wood), washing machines (the complete washer), and over one hundred different articles, tools and implements used in the household.

G. F. Atkinson. Wood turning and articles turned from California woods.

R. W. Brehm. Wood turning and articles turned from California woods.

The above exhibits of wood turning always attracted a crowd to see with what ease and quickness a rough piece of wood in the hands of a skillful turner could be changed into objects of use and beauty. All manner of useful and ornamental articles were manufactured at the fair by them, and found

a ready sale. Large quantities of these articles are shipped to the East, where they find purchasers at lucrative prices, both for their beauty and as samples of California woods.

O. R. Coe. Mann's health lift and reactionatory lifter. From its mechanical construction, and many testimonials of the good effects derived from its use, we should deem it a very good and effective apparatus for physical exercise.

DIVISION V.

Chemical and Pharmaceutical Preparations.

Under this heading is included an almost infinite variety of drugs, dyes, etc.; in fine, of all those articles which are formed by the chemical union of two or more compounds. Some of those noticed in preceding divisions may have probably been susceptible of being embraced under this head, though arranged for convenience sake and other causes, in a different manner. For the matter of that there is no article in the preparation of it which heat is used that does not more or less properly fall under this division. The number of different chemical and pharmaceutical preparations is almost infinite, but their manufacture in California or on the Pacific Coast is very limited—Great Britain, France, Germany and the East supplying them to almost all the world. The Pacific Coast, however, is so well supplied by nature with all of the metals and minerals from which these preparations are usually obtained, that it might be supposed considerable headway had been made in their manufacture. Such has not been the case, the number of such articles made being at any time but few, and the success attending the prosecution of any of the industries thus formed having been but indifferent. It may, though, be expected that in proportion as the resources of the coast become in this respect better known and their development more attended to by men of capital, that this state of things will change. At present, however, the Pacific Coast must be contented with a very poor showing in this regard.

The preparation of acids forms a most important industry, and was formerly prosecuted on the coast with much more success than at present. The expectations at one time entertained of the prospects of this industry may be best judged by an inspection of the fine works near Brannan street and in other places, and the former of which must have itself cost quite a large capital in its construction. Of factories engaged in the preparation of acids—of nitric, muriatic, and sulphuric acid—there have been five; one of these failed a few years ago; the others still exist, but only as shadows of their former selves. Japan used to take a good deal of acids from this city, but of late

years she has taken to manufacturing them herself, and consequently the demand has dropped off. The factories are, therefore, not fully employed. Blue vitriol has been largely made by a factory at Hunter's Point, and as a by-product of the gold and silver refining works. It is largely used in the State, and what is manufactured here is supplemented by Eastern and English importations. The preparation of sal soda has been noted previously under another division, as also has that of bi-carb. soda. Soda ash used to be prepared here in considerable quantity, but its manufacture has ceased, and now the market is supplied exclusively by the English product. None of these preparations have been on exhibition, singular to say, although they are of great importance, and, for aught that we might learn to the contrary, a visitor might have visited the pavilion without ever dreaming that the establishments alluded to had an existence, or that we had advanced sufficiently to produce these articles. Let it not be so on another occasion. There are altogether eight establishments of different kinds producing chemicals, and the value of their product may be given at $450,000, or nearly half a million dollars per annum. By and by, in proportion as a knowledge of the resources of the coast extends, all of these severally mentioned will form by themselves great and important industries, while the field of labor in this direction will have been extended in a manner now undreamed of.

The manufacture of gunpowder on this coast has attained great importance. It has been the growth of a few years, and shows what may be done by active and earnest endeavor in the face of the greatest difficulties, for notwithstanding that the contest was waged with several powerful foreign companies with almost unlimited resources, they have been driven from the field, one by one, until now only one remains, and the proportion of the powder distributed from San Francisco that it will supply, will not at the greatest, exceed one-fourth. The importance of the manufacture to the mining interests of this coast can not be overestimated, and its status now is nothing to what it will be. The quantity made last year was 132,000 packages of black powder--of which this year about 150,000 packages will be made. Besides this, there is made of Giant and Hercules powder somewhere like 800,000 pounds annually. The former was placed on exhibition at the Fair, being the only one in the same line made this year. An Eastern powder man visiting the pavilion would, if otherwise unenlightened, come to the conclusion that there was abundant room in California and the Pacific Coast for the sale of Eastern made powder. As elsewhere noted, the materials used in the manufacture of gunpowder, such as Nitrate of Soda, Saltpetre, etc., are found on this coast, but the deposits containing them have not yet been sufficiently developed, and then the cost of transportation is too high, did other circumstances favor their extended utilization.

One of the principal ingredients in the manufacture of Giant Powder, etc., is glycerine, an animal product, which, however, is only obtained through chemical processes. It used to be all imported, and is still largely so, whole car loads of it coming consigned to different houses; but the local manufacturers of candles now produce it largely, and in time, no doubt, will have all

the field to themselves. It has various other uses besides that of helping to make Giant powder. It is used for medicinal purposes, mixing bad whisky, etc., and cannot fail, in years to come, to be a most notable article of production. The quantity made this year will be about 225,000 pounds, valued at $36,000.

Yeast powders, so important as an article of domestic economy, have been represented this year by only two of the manufacturers that are in the business here in the city. Both are very good in their way, one, however, though subserving the same purpose, we mean the yeast cakes, hardly coming under the description of yeast powder. The manufacture in the city has attained such importance that the Eastern yeast powders have been, to a great extent, superseded by those of local make. The quantity made in this city will reach about 5,000 gross annually, while importations will vary from 4,000 to 5,000; so that there is still considerable work before local manufacturers, if they wish to keep the field to themselves. Closely connected with the business of yeast powder manufacturing is that of the preparation and sale of Cream Tartar and Bicarb. Soda, which reach the city from France and England in large quantities. Of the former, about 200,000 pounds were sold last year; of the latter, the importation was over 670,000 pounds. As previously stated, a company was started some time since in San Francisco to supply an article made from Nevada Soda, and the rivalry between the company and the importers has been fierce and uncompromising. What the result may be is of course uncertain, but there exists ample room for competition. The value of the Yeast Powder, Cream Tartar, etc., turned out annually by our Yeast Powder factories, or sold by them, cannot be far from $200,000, and is constantly on the increase.

Many minerals refined by chemical processes, some of which have been heretofore noted, are imported in large quantities annually, and will hereafter give employment to many important industrial establishments.

The importation of ammoniacal preparations has almost ceased; the imported article being in the main superseded by the local manufactured, which have for a few years been an important by-product of our gas works. It was well represented at the Exhibition this year, as well as in former years. The utility of ammonia for domestic purposes is well-known, as is also that of the various other compound products evolved with it, and we need only say that the information as to the practical uses which would be conveyed to the general public by placing them on exhibition, would immensely outweigh any care or trouble involved.

Although glass is not generally looked upon as a chemical product in the more common acceptation of the term, yet as it is really a product formed by the chemical combination of very dissimilar substances, we choose to refer to it here. Three exhibits of glassware were made in the Pavilion this year; that of the San Francisco and Pacific Glass Works; another, portion of a collection of imported fancy goods, and a third, specimens of glass roofing. Hitherto in San Francisco the manufacture of glassware has been carried on under considerable difficulties, principally in consequence of the active competition

of German manufacturers. That competition is still carried on, but in consequence of the concentration of capital and resources locally, it is less felt now than formerly, and will probably in a few years have entirely disappeared. The description of glass manufactured in this city is green and black bottle glass, of which an immense quantity is annually used in this State. This was represented in the Exhibition by a pretty and graceful pyramid, in which almost every imaginable bottle, phial, retort, demijohn, flask or carboy ever invented or thought of had a place. The value of glassware at present made in the city is $225,000 annually, while the value of that imported is much larger. In fact, there exists quite sufficient room for the establishment of two or three large and flourishing factories if the importation of German and French bottles, demijohns, etc., could be put a stop to. The value of all imported glassware cannot be much less than $1,000,000 a year at first hand, and much more at second hand. This includes flat glass of all kinds, plate glass, ornamental glassware, etc. It will doubtless be a long time before any attempt will be or can be made to manufacture any of this glass here. The specimens of fancy glassware, jugs, cups, basins, etc., shown were the most elaborate we have seen for many a day, were in fact faultless in every way and real works of art; as much so indeed as any painting that ever left a master's easel, or any piece of sculpture carved out by his chisel. California may be proud of the skill and genius of her sons when they can equal it.

In this connection we may make mention of the existence of a mirror-silvering establishment which has been at work for the past few years. From it have come most of the splendid mirrors that adorn the hotels and important private residences of our city. Its annual product will average $50,000 in value.

And here guided by the principle of association of ideas, rather perhaps than by any fitness or congeniality in the subjects, we may note the exhibits of stained, embossed, colored and bent glass which formed so notable and interesting objects of attention to all visitors to the Pavilion. In reality they should be amongst the subjects classified under the head of liberal arts, for the specimens that attracted the attention of those who saw them were really and truly works of art. There were two exhibitors, and we are informed that both of them do a large and profitable business, owing to the increased culture and taste of the builders of private residences in and around the city. But pioneers of the art have had a hard time of it. The stained and embossed work, the latter especially, is beyond all praise. By his art the embosser can produce the greatest painting ever limned by artist's brush in all its original force and vigor. The bent glass exhibited was really a marvel in its way, and at first sight the field presented to the spectator the appearance of plates of solid silver.

Artificial stone is another of those articles that would seem to find a much more appropriate place in some other section, but inasmuch as it is produced entirely by chemical process, and by the use in great part of what are familiarly known as chemical compounds, we notice it here. It has assumed during the last four years, great importance as an article of manufacture, and at present there are not less than three separate and individual establishments

worked under three separate patents. By its use, in a great measure, the labor and expense of carrying natural building stone for long distances is avoided, while any required form may be readily given to it. This, of course, entirely dispenses with what under any other system must always remain a large item of expense, to-wit: that of cutting and finishing the stone into proper shape. Quite a large number of first-class buildings in this city have used it for ornamental purposes, for facings, frescoes, cornices, pillars, etc., and it is more and more sought after every day. There does not seem to be any reason, why, under the process used to produce this, or under similar ones, stone of any kind, color or description could not be manufactured. We think that through the discovery that underlies the process employed, a great revolution will be effected in the future of building. The value of the stone now made annually in the city is about $150,000.

About bitters, which are sometimes, though for what reason we know not, placed under the head of chemical productions, but little need be said. We shall follow the usual custom of noticing them under this head, and may say that there were six different kinds shown in the Pavilion; the difference in which probably lays in the varying amount of wine, brandy or alcohol forming their basis. Bitters are often considered an indispensable thing, and while there are still 18,000 to 20,000 cases a year imported from Great Britain or Germany and the East, there is still ample room for the exertions of our California bitter shops.

Notable in the Fair were several exhibitors of printer's and other inks, by first-class houses. They, however, were all Eastern, and it would naturally suggest itself to a thinker, that in a section where so much printer's ink was poured out as in this section, that there should be some means of having it here without sending for it three thousand miles away, and accordingly, several attempts have been made to start ink factories, but most of them failed. There has been, however, considerable ink, and of very superior quality and of many varied and beautiful colors, manufactured here, in conjunction with blue, also manufactured in a small way, reaching about $100,000 in a year. The future will, however, find more successes in this particular department than has been done in the past.

In other places, notably in London, the manufacture of shoe blacking forms a great and profitable industry; and in California, Nevada, Oregon, etc., the quantity used is very large, and forms quite an important article of merchandise. There can be no reason beyond that contained in a preference for particular brands, why the manufacture should not be successful in California. It has been carried on here for several years, but owing to various circumstances, never attained any very large dimensions as an industry. This year, as for several others, the Pioneer has exhibited specimens of his manufacture which appear to be really creditable and meritorious, and we see no reason why, under a more propitious star, it should not attain more respectable proportions and put a stop to Eastern and English importations.

Perfumery, to a small extent, has been made in San Francisco from time to time, but not in a sufficiently large way to deserve the name ot an industry.

Importations every year are, however, very large, and they have been well represented in the Pavilion, several importers having competed for public favor. They are interesting, as showing to what perfection the art has attained in other places, but offered no satisfaction to him who is seeking for evidences of San Francisco's industrial advancement.

Finally, under this heading, we shall include varnish; for what, in consequence of the varied nature of the ingredients of which they are made, we fail to find a place in any other of the sections. Here there has been only one exhibit, but it has been such a one as those who feel interested in the advancement of Pacific Coast manufactures, may feel proud. The industry of which they were a representative has grown in this city slowly and quietly for years, but not till lately did it attain that meed of success of which it was deserving. The importation of varnishes to this coast is quite large every year, and a very large establishment could be kept constantly employed supplying the demand of the trade in this city.

EXHIBITS IN DIVISION V.

Peter Burns. Ammonia bleaching soap (patented). The component parts of this soap are tallow, cocoanut oil, caustic soda, borax, benzine, ammonia, and alcohol. It is claimed to remove oil or stains from the finest fabrics without injury to the goods; also, to remove grease or tar from woolen goods, and produce no change of colors. For the toilet, kitchen or laundry it is a superior article; for removing printers' ink from the hands or type it is invaluable. Mr. Burns commenced the manufacture of soap in this city in 1864, and has followed it successfully until the present.

Alta Soap Co. Had a finely assorted lot of borax soap, including toilet, detersive, harness, and assorted soaps.

New England Soap Works, H. Fishbeck & Co. Toilet, bleaching, common soaps, and washing powder. This company commenced business here as early as 1852. The value of the raw material used is about $28,000 per annum, of which amount $14,000 worth is produced here. The manufactured products are worth $35,000 per year; the average number of employees is six.

Hall & Wagner. Bleaching soap. This soap has an established reputation, and is extensively used throughout the coast.

John G. Hodge & Co. Colgate's "Violet Toilet Water," and "Sterling" (laundry) soap. The manufactory of these articles, in New York, is probably the most extensive of the kind in the United States, their annual sales amounting to upwards of $5,000,000. The former article is very highly esteemed as a perfume for the bath or handkerchief.

Standard Soap Co. Toilet, bleaching, and common soaps. The following

portions of a letter from the proprietors of this extensive establishment we give, as of interest:

"The Standard Soap Company was established in 1860, with a capital of $1,000. At that time there were eight soap factories, of considerable importance, in the city. Business was good and the profits were large. In 1871 we bought the Eureka Soap Company, and in 1872 the J. H. C. Portmann Soap Works. Since then, the following brands have been purchased, and are now entirely manufactured by us: 'California Soap Company's Chemical Olive,' 'Challenge,' 'Kane's Condensed,' 'Kane's Ammonia,' 'Bergin's,' etc.

In 1864, large shipments of soaps were made by Eastern factories, which have greatly fallen off until, during the past year, the importations were nearly nominal.

Lately, strenuous efforts are being made by Eastern manufacturers to force their goods on our market. While the quality of their goods is excellent, we fully maintain that we can defy such competition, not only by producing a quality of soap fully equal, if not superior, by putting up in as attractive shape, and by placing it at a price so ruinously low as to incur loss to any who have to add freight to original cost of manufacture.

We are now making a large variety of toilet soaps which are meeting with considerable favor.

The increased demand for California soaps has led us to erect the largest factory on the Pacific slope. The main building is 100x250 feet, three stories high, with two side wings, each 20x250 feet, and two end wings, each 40x100 feet, besides box factory and engine room.

The warehouse, 200 feet distant from the main building, for the storing of manufactured goods, is 40x250.

With these increased facilities, aided by new and improved machinery, we think will fully enable us to meet the utmost requirements of the trade.

S. F. Gas Light Co. Ammonia and its compounds. This indispensable article is now extensively manufactured by this company from the refuse of the gas works, thus utilizing an otherwise waste product.

California Fertilizing Co. Disinfecting fluid and fertilizers. This company recently organized, is now placing in the market a very superior disinfectant for sinks, sewers, etc. Also pure fertilizers made from the city's refuse matter, thus utilizing a waste product dangerous to the health of the people, and giving in return a valuable compound for the gardener and florist.

Hueter Bros. & Co. Gums, varnishes, bronze powders, artists' materials, etc. This display was in every way creditable to this enterprising firm. Every kind of varnish is manufactured by them, and of such quality and price as to nearly stop the importation. Only the finest quality of gums are used, of which they import large quantities. They also exhibited eighty vases of the celebrated Ansbacher colors, no two alike. Sealing wax, flower wax and artists' materials are made by them. Of the sealing wax, large quantities is used during the fruit season for sealing can and jars.

HENRY LAKE. Patent Japan shoe blacking. Mr. Lake commenced the manufacture of blacking in this city in 1868, and has succeeded in establishing a very successful business. He makes it both as a paste and liquid. It takes a fine polish, and does not soil the clothing. Wherever exhibited it has always taken a first premium. The value of the raw material used per year (ivory black, oil and tin) is about $3,500. Three men are employed, and improved machinery is used at the factory.

W. H. CAMPBELL. Composition for removing incrustation from steam boilers. This article was used in the boilers of the Exhibition with good effect, the engineer certifying to its valuable properties.

SAN FRANCISCO AND PACIFIC GLASS WORKS. Demijohns, bottles, vials, fruit jars, etc. The Pacific Glass Works and the San Francisco Glass Works, formerly two rival establishments, consolidated to form the present company, and under one management and incorporated, the business has become very successful and lucrative, and at the same time the means of supplying the Pacific slope with cheaper and better goods than can be obtained from the East.

Glass being made of sand and soda is a heavy article, as well as a difficult one for transportation on account of the immense amount of waste material necessary for its safe transportation. Shipped here from the East, the freight becomes the principal item in its cost, consequently a factory here can compete with Eastern prices and still have a fair margin left for profit.

In the line of jars for fresh fruit, this establishment has been of great value to the people of this coast, reducing their cost to the consumer nearly thirty per cent. Of these, they manufacture the "Gem," the "Groove Ring" and Mason's porcelain-lined jars. The former is the favorite, and is an excellent jar for practical purposes. The Groove Ring is a much cheaper jar, having a tin lid which is secured and made tight by the use of sealing wax, and is said to effectually preserve its contents. The Mason is a porcelain-lined jar of great value and strength, and a favorite with some for particular uses. All are good, and furnished to wholesale dealers on exceedingly low terms.

The capacity of the works on King street is equal to the demands of the whole Pacific slope, amounting to upwards of $120,000 per annum. They run eight large pots when working full-handed, and turn out a very superior article of ware.

CARLTON NEWMAN. Patent tule-covered demijohns. This invention for the safety of glass is of vast importance in preserving it from breakage by rough handling or accident. It also assists in utilizing part of the immense growth of tule in this State, that can now be turned to profit for that and similar purposes. A boxed demijohn of his patent and invention is also meeting with much favor from shippers and others. It is particularly valuable for acids and other dangerous compounds, as it is almost impossible for breakage to occur to the demijohn when encased by it.

REDINGTON & Co. Flavoring extracts. A very large assortment, and displayed in a very attractive manner.

S. H. Nicholson. Flavoring extracts, California manufacture. This exhibit of a home industry was most creditable; embracing fifteen varieties. Our native fruits are used to a great extent by him in preparing the extracts, and it is to be hoped that our citizens will patronize this home manufacture, and thus assist a worthy enterprise. The quality and quantity are strictly guaranteed.

J. R. Gates & Co. Flavoring extracts and medicines.

Newman & Bennett. Perfumery and standard medicines; fine display.

John Mallon. Cut, ground, bent, stained and embossed glass. The glass cutting business was commenced by Mr. Mallon in this city in 1858. In 1869 he added to his business, staining, bending and embossing. At present the average number of employees is fourteen, and the value of the finished articles per annum, $33,000. The value of the raw material used is about $12,000, of which only one-tenth, lead, oil and colors, is produced here. Twenty-seven of the churches of this coast have stained windows from his factory. Many of the designs were very artistic, and evinced the highest degree of excellence.

Whittier, Fuller & Co. Silvered, bent glass, both convex and concave surfaces. This difficult part of the mirror business has been lately introduced in these extensive works.

Thomas O'Neil. Glass in almost every form used in architecture or ornamentation. The embossed glass displayed by him was particularly fine, showing remarkable beauty and workmanship, and we are informed that any picture can be faithfully reproduced on glass by this method.

Shattuck & Fletcher. Printing and lithographic inks and printing rollers. This exhibit of a new and important home industry was in every way most creditable to this enterprising firm and gratifying to those who note the advances made in new manufactures in this State. They commenced business about eighteen months ago, and are already supplying nearly all the printing offices in this city, as shown by the specimens on exhibition. A great amount of fine printing, such as salmon and fruit labels, show cards and cut posters, has been executed East heretofore for this market, on account of the difficulty in getting inks fresh and suitable. That cause is now removed, and most probably all that kind of work will in future be done here. The rollers they manufacture also give the best of satisfaction, and are guaranteed to always print, or will be recast and all charges paid.

Giant Powder Co. Specimens of this powder in the grain and in cartridges, also fuse and explosive caps. The wonderful and most destructive

power of this article is well known. The committee appointed at our last fair to examine this powder, after making many tests and experiments with it, gave it as their decided opinion that the Giant powder is a most important invention, especially to the mining and tunneling enterprises of this coast; that this powder exhibits an energy and explosive force vastly greater than any other we have seen and examined; that it is very safe to use, and not liable to explosion in handling or transportation, nor to spontaneous decomposition; that shocks alone, nor fire alone will not explode it, but a combination of the two, as exemplified by their percussion fuse, must be employed to effect an explosion.

E. B. Smith & Co. Seltzer water from the Litton Springs in Sonoma county.

H. A. Benjamin. Pacific Congress Spring waters, consisting of Pacific Congress and Seltzer waters first introduced in the city of San Francisco and the Pacific Coast in the year 1864. These waters are not manufactured, but are the natural waters from the Pacific Congress Springs of Santa Clára County, California, located about ten miles southwest of San Jose, in the Coast Range mountains. Six men are constantly employed, and sometimes more, in bottling, packing and delivering in cases and barrels. The mineral properties of the water are as follows, as shown by the assay of B. B. Thayer, State Assayer: Chloride of sodium, sulphate of soda, carbonate of soda, carbonate of iron, carbonate of lime, silica, alumina and magnesia, and considered an infallible specific for many complaints. Shipments of the water are made to the Sandwich Islands, Japan, China, and all the States and Territories of the Pacific Coast; also to Utah Territory and State of Nevada, which is good evidence that California can produce mineral waters equal to the imported from Germany or other parts of Europe.

Bowen Brothers. Yeast Powder (Bowen Premium). These powders are well known and very extensively used in this State, and give universal satisfaction. Their analysis shows them to be free from any deleterious substance. Most of the ingredients used in their manufacture are produced here.

Potrero Compressed Yeast Powder Co. Compressed yeast. This new industry and article is meeting with great favor. Being in a solid and convenient form it can be kept at any temperature or in any place, and is always ready for use. Large quantities were distributed during the Fair, which, no doubt, will bring a good return. The bread and cake raised by this yeast is very light and sweet. The company only started this year, but already employ from twelve to fifteen men, and their works have a capacity of producing 1,000 pounds of compressed yeast per day.

DIVISION VI.

Machinery.

For six thousand years, according to Archbishop Usher—for a much longer period, according to others—man fought against nature with little else than his bare hands; for fifty years past he has fought the forces of nature with machinery. All the great wonders of the world, the Pyramids, the Colosseum, other famous structures, were raised, so far as we know, without the aid of machinery, and it has only been within the present century that men have learned to use and apply it. If there is anything new under the sun, and if Solomon was mistaken when he said there was not, one of these new things is machinery, at least as it is understood in the present day. Said Archimedes, the geometrician: "Give me a fulcrum for my lever, and I will move the world." The modern machinist essays to remove mountains, to bore through the bowels of the everlasting hills, "to make fire, air and earth, the vassals of the will." The machines of early days were mostly all instruments of war, such as those for hurling rocks, etc., against the walls of a beleaguered city; that invented by Archimedes, with which he burned the hostile fleet in the bay of Syracuse, and others of a similar kind. The present, however, is emphatically the age of machinery. There is very little now that is not or may not be done by its aid; fifty years hence there will be nothing possible that may not be done by its aid. The utilization of steam as a motive power it was which started the industrial world on its present path. At first people began to use machinery in a small way, and for a few purposes—gradually its aid was sought for other things, and now there is nothing for which it is not ordained to be used. It lessens labor and increases power, and makes it possible for men either to produce more or to give up a portion of the time heretofore devoted to toil to amusement, improvement of the mind, and recreation. It increases many times man's productive power, and if honors should be paid to the man who makes one blade of grass grow where none grew before, why not, also, to those who enable one man to do the work that ten men toiled at before? The ultimate effect of the extensive use of machinery will be, therefore, to economize labor or to increase production, perhaps partly to do both. The change already effected in this way is wonderful; even during the past ten years it is wonderful; and it is no uncommon thing to hear of machines which enable one man to do the work that it took five to do at the beginning of the decade. There is no doubt that the work of increasing the power and efficiency of machinery shall go on until results which would now seem wonderful shall be attained, and until the primal curse, "in the sweat of thy brow shalt thou earn thy bread," will be removed, as far as it is in the nature of things for it to be so done. One result of the great increase of machinery is the immense development that

by it has been given to the iron industry, and that has rendered an iron mine of to-day more valuable than many a gold mine of olden days had been. There are other results, social and economical, which it hardly comes within the limits of a brief article like this to discuss; we therefore proceed to the consideration of the general subject of what a general exhibition of machinery should show. It should not be so much a mere assemblage of the various kinds of machines that are used in the district where the display is held, as a display of improvements that had been effected since the last show had closed, and of the advances that had been made during the interval; and in this respect it should not be merely local; it should be under the superintendence of a well informed expert, who would group together, under their proper headings, all the great improvements and discoveries that had been made throughout the world, and, in particular, of those more especially adapted to the needs and necessities of the district where the exhibition was held; and it would not even be amiss to employ a lecturer to explain the nature and uses of the exhibits, and the advances that had been made in various departments by each of them, in the particular of strength of parts, simplicity of construction, concentration of power, and cheapness.

In the matter of engines or of machines for the generation of power, the display was rather limited, and some of the engines were ones that had been seen before, with the exception, perhaps, of one very effective straw-burner, and one or two other matters. There were shown very superior and very strong boiler tubes and plates of Eastern production, but no completely finished boilers, as in former years. Now, San Francisco has the reputation of turning out from her foundries and boiler shops some splendid engines and boilers, and it is to be regretted that they were not better represented in this last exposition. Of the later devices for increasing the strength and safety of boilers, for preventing the waste of the steam generated, or for the simplification and strengthening of the other parts of the engine, nothing was to be seen, though the annals of mechanical science are full of them and though the practical men that we have engaged in manufactures here in San Francisco are not slow to avail themselves of them.

Of *media* for the transmission of power when generated we have had in this exposition the wire rope from the factory of Mr. Hallidie, and the leather and raw-hide belting from two other factories are the only exhibits, and they have been already noted, each under its appropriate heading. Improvement in this regard is almost as important as in that of the steam-engine itself.

The most important division of this section is that which should be allotted to mining machinery. The days when the pick, shovel, and cradle ruled the roast are long since passed away, and now nothing can be done without expensive and costly machinery. The machinery used in the mining regions of this coast is of immense value, representing as it does the expenditure of millions on millions, year after year, for the past twenty-five years or more. And San Francisco is especially notable for the skill of its machinists in devising and manufacturing machinery suited to the work needed of them in developing the mines of this coast. It was early discovered that imported

machinery did not suit the circumstances of the case; hence the growth of the manufacture of machinery in this city. There has not been this year any great display of mining machinery or appurtenances. No rock-drills—the tester of shareholders, telling as it does to the management on the inside work, secrets revealed by it that the outside world know not of—were exhibited this year. A few machines, most of which were placed on exhibition last year, were all that were noticeable. A concentrator by Hendy, a couple of automatic ore-feeders, and a few other articles, were all that were to be seen in this division that pertained specially to the mining industry of the coast. We hope that this will not be the case next year, and that, on the occasion of the next fair, a full representation of the machinery used in this important industry shall be made. We think that the means by which we tunnel mountains and wash down hills and extract from their recesses or their *débris* the precious and base metals, should be more plainly shown, and that a more interesting or instructive department could not be made.

In the matter of hydraulic motors, pumps, etc., the machinery department was more complete than any other, and, though the miniature Niagara that has been seen in this department in Philadelphia was not rivaled, yet the constant quick stroke of the piston-rods and the noise of the discharge and running away of water raised, combined to show the importance of pumps and pumping machinery to the agricultural and mining interests of the coast. Under the head of pumps there were no less than seven different descriptions displayed, nearly all worked by steam, and all very effective for the purposes for which they were designed. The proportion of steam converted into power in these ranged from 34 to 43 per cent. The amount lost in this instance, though not singular as applied to pumps, shows the vast room for improvement that there is in the perfection of the steam-engine itself. An inventor who could produce an engine losing not more than five per cent. of power would make a fortune for himself and confer an immense benefit on all kinds of industry, and on every department of labor, as he would reduce the cost of operating machinery to nearly a third of that which it is at present. What vast benefits to commerce, transportation, manufactures, and agriculture would follow can be easily conceived. But to return to our subject. The loss of water through leakage and friction in most of these pumps is remarkably small. This portion of the mechanical department is worthy of a separate division in the next fair, as without this species of machinery our mines could not be worked, while they are manifestly of the greatest service in irrigation.

For service in the latter way, the windmills perform a by no means unimportant part. The number of different windmills, with some peculiar advantage for each, is almost without end, but only three entries were made under this head; good serviceable machines, that have been exhibited previously, and the merits of which are well and widely known.

Agricultural implements form probably the most important class of machinery that can be brought under the notice of the people of this coast. The tendency of the present age is to do everything by machinery, and nowhere is this tendency more strongly marked than in the harvest field. The farmer of one

hundred, of fifty or sixty, of even thirty years ago, who should suddenly revisit the glimpses of the moon, and betake himself to the scenes of his former labors, would fancy himself transported to another world, and would be lost amidst the numberless machines that had usurped the place previously occupied by the laborer, and that had relegated the old-fashioned scythe, plow, harrow and reaping hook to the museums wherein are deposited the relics of a by-gone age. It is owing to the extensive application of machinery to agricultura purposes that the farmers of the United States, despite the payment of much higher wages and the transportation of their produce to market from immense distances, are able to compete in the markets of England, France and Belgium with Russia and other wheat growing countries of Europe and America, where the remuneration of the laborer is much lower than that ever offered to Chinese workmen on this coast. California imports every year agricultural machinery to the value of at least three millions of dollars, while her importations with her increased agricultural development are constantly increasing. Hence the importance of improvements to those who expend all this money, and the importance of a place where they may all be seen. In the Mechanics' Institute Fair this year the exhibits in this class though notable, were not, it seemed to us, so numerous as they were last year, nor was anything particularly new to examine. Most of the plows, mowers, wagons, harvesters, etc., were those with which the public are already familiar, and the excellence of which are universally acknowledged. California was very badly represented, for although there are considerable agricultural implements manufactured in California, we do not now call to mind more than three exhibits in this department that could be credited to the State. There is in California enough inventive skill to make improvements on the machines already in use, and this being done, the chances would be very favorable for turning over the money sent out of the State annually for this description of machinery to the pockets of our own manufacturers and artisans.

The world is greatly indebted to Elias Howe for the invention of the sewing machine, which has lessened the labors of the fairer portion of humanity to such an extent, but some credit is also due to the large number of inventors who have followed in his footsteps, and who have made the first crude machine the highly perfect one it now is. In the Fair just closed not less than twelve different styles of machines were represented for the criticism of the public, who had ample opportunity of becoming acquainted with the respective merits of those thus brought under their notice. So far as concerned ladies' work, this part of the exhibition was about perfect, but there was no representative of those machines which are used on boot and shoe, etc., making, or of the new one first used last year for the manufacture of bags in this city.

In the matter of miscellaneous machinery, that is those machines which apply the power generated in the steam boiler to the work in hand, or those which are worked by hand themselves, there is in this city a very great variety indeed, enough to fill up by itself a building of the size of the Pavilion, but the exhibits of this class, or of models of them, were few and far between. Of their great number, no one who has not been through the factories of this city can form the least idea. In some instances, as in that of cracker baking

for example, there is used machinery where the flour goes in at one end, and the thoroughly baked bread comes out of the other, but nothing of the kind could be seen at the Pavilion. In such cases we think that it would be both interesting and instructive to have models of the machinery on hand for the inspection of the curious and the interested.

Although coming more properly under the heading of scientific apparatus and instruments, yet in consequence of the exhibition on the collection of several electrical and other machines, we mention here the display of St. Ignatius College, which was one of the most complete ever publicly exhibited before, and which, in consequence of the displays of the electro light made, and the appearance in operation of many of the instruments, etc., was one of the most interesting features of the whole exhibition. It enabled the observer to form some idea of the wonders shown by science in the nineteenth century. Besides this display there were also on exhibition two galvanic batteries, both manufactured in the city, and on that account doubly interesting, as showing that we may by and by be proficient in what Paris is now so famous, for the manufacture of scientific and philosophical instruments. An exhibition of optical instruments by a well known manufacturer of this city was also interesting as showing the perfection that we have already reached in this direction.

Amongst the most notable of the exhibits in the machinery department, of a miscellaneous character, were the ice machine, the knitting machine, the dovetailing machine, and the machine for making baskets. The first three have been seen in operation before, the latter is here entirely new and operated by women; is simple in construction, and is likely to prove of great use in the development of this industry. The method of using it was shown at the Fair, where it attracted great attention from its novelty. A machine for silk braiding and spooling also attracted a great deal of attention.

In a city where the manufactures in lumber are of such interest and importance, and where there are such a great number of wood working machines used, many of them the invention of mechanics of this city, we should have expected to have seen a much better showing of wood working machinery than what there really was. It was confined to 16 exhibits of the Pacific Saw Co. and a few shingle machines, etc., which though excellent in themselves, and peculiarly well adapted for the purposes for which they were designed, enable the intelligent visitor to form no idea at all of the number, variety and perfection of the wood working machinery used or manufactured in this city. The saws shown included almost everything in the line of saws, from the tiny one used by a dentist to the gigantic one used in the forests or lumber mills of the coast; circular, square, etc. Many people never in their lives before could think of the numerous uses to which saws might be put to, or of the great number of different kinds that were needed in labor or manufactories. The fact that they were all the production of skilled mechanics on this coast, was not the least gratifying feature about them, and teaches a lesson that should not be lost sight of. There was no particular reason, beyond that contained in pluck and energy on the part of the pioneers of this business, why saws should not be imported in their numerous varieties to the Pacific

Coast, as are dozens of other articles included in this section which had no one to pioneer their introduction. We refer in particular to the knives, planers, etc., now used in such great numbers and in so many industries in this city and over the coast. Some feeble attempts have been made to manufacture them, and if properly managed they could support an industrial establishment as large as that of the saw company, just noted. This city supports a goodly number of machinists, but nothing like the number that ought to be supported in it. It should supply the latest and most improved machinery, not only to California, Nevada, Oregon, Utah, and the other Pacific Coast States and Territories, but to British Columbia, Mexico, Central and Western South America, China, Japan, and Australia. It is said that American engines are now being introduced into Europe. Why should they not be introduced into those countries also, and manufactured in San Francisco? There is no reason save lack of capital or enterprise, the latter most probably. By taking the measures recommended in the introductory remarks relating to this section, visitors from foreign countries would be attracted, who could inspect our exhibits and make themselves acquainted with our abilities in this line, and doing so would, on returning, cause a desire to spring up amongst their people for seeking such articles of machinery as they needed, amongst us. When fully represented, no part of an exposition is more attractive than the machinery one, for there the visitor may see the tools with which modern civilization works, in all their variety and importance; and which, guided by the hand of the laborer, rears cities in the wilderness, bridges the ocean, chains the lightning, and makes the desert places of the earth blossom as the rose.

EXHIBITS IN DIVISION VI.

Fulton Foundry, Hinckly & Co. Horizontal engine. This was the large engine used for driving the main-line shaft and supplying power to exhibitors. The cylinder is eighteen inches in diameter and thirty-six inch stroke, with a variable cut-off on the well-known Myers' system, adjustable by hand, with an independent governor. The grade of expansion or point of cut-off can thus be changed at will to any point between the extremes of full stroke and no steam, according to the power required or work to be done. The engine is very compactly and strongly built, special care having evidently been taken in designing it, to place the metal where it would do the most good in resisting strains and insuring rigidity of the various parts. The wearing surfaces are all made large to avoid heating and unnecessary friction, and adjustments are provided in all cases for taking up wear as it occurs, thus doing away with all thumping and lost motion. The crank shaft is eight inches in diameter and nine feet long; the fly-wheel sixteen feet in diameter and weighing five tons. The crank is a circular disk with a balance weight opposite the crank-pin, and, being highly finished, adds greatly to the appearance as well as to the working qualities of the engine. The engine is highly finished throughout, which gives it a very fine and elegant appearance, and its working qualities have been amply proven by the steady and noiseless manner in which it has

run during the entire exhibition, making no sound or jar, though running at the rather unusual speed for a large stationary engine of four hundred feet of piston per minute. This is but one of the many engines and machines manufactured by this firm during the past year, all of which are equally well and scientifically made, and wherever used receive the highest praise and recommendation.

Hawkins & Cantrell. Hoisting engines. The two large hoisting engines exhibited by this firm are good samples of the style they have adopted for the above purpose. They are made heavier and stronger than those of Eastern manufacture, it being necessary in mining work to have them of the strongest and most durable character. The large double engines are made with locomotive boilers and intended to hoist from a depth of 1,000 feet. The smaller ones with a single engine and reel have vertical engines. One of the engines exhibited is a 20-horse power one and weighs about 7,500 pounds. The smaller is a 10-horse power engine.

A number of the largest size of this class of engines are in use on the Comstock for prospecting purposes and in several cases are used for regular mining work at considerable depth. As a usual thing, however, engines of this kind are mainly used for prospecting purposes before large and heavy hoisting works are built. They are made with a heavy iron frame and so arranged that an engine, boiler, etc., can be shipped as one piece and set to work in an hour after arriving at the mine. It only needs a few timbers upon which to bolt the frame and it is all ready. Being much less expensive than heavy large hoisting engines, these are in demand for opening mines.

The largest size engines made of this class by Hawkins & Cantrell are double hoisting engines with link motion and double reel. One of 40-horse power only occupies a space of 20x14 feet; one of its advantages is that the engineer can control the brakes and the hoisting from two separate shafts and run his engine at one and the same time. The convenience of this arrangement can easily be seen by mining men.

The engine, which is more especially intended for small mines, is so simple that it requires no skilled labor to set it up, as the boiler and engine are both within one frame. An engine of this kind can, for five years at least from the opening of the mine, keep a 20-stamp mill at work at an expense much less than any other pattern.

Huntington, Hopkins & Co. The Rider compression engine. This engine attracted much attention during the Fair. A motor having the advantages claimed by it is something that is urgently needed everywhere. Among the many claims set forth in its favor as a motor is its perfect safety under all circumstances and conditions. Unlike a steam engine, no explosion is possible. Unlike a Caloric engine, it emits no heated air or sparks of carbonized oil, as all the air is continuously retained within the engine, and cooled down below the temperature of the surrounding atmosphere at each revolution, thus making the engine as safe as an ordinary stove.

Its extreme simplicity. It has not a valve, spring, cam, eccentric, or any loose or delicate part about it to get out of order.

Its great economy. Twenty to thirty pounds of coal being sufficient to run a one-horse power engine ten hours.

It is perfectly noiseless.

Having no valves, there is no exhaust or escape of burned oil, or any noxious odor.

It requires no engineer, and little skill to operate it, as it has no boiler and uses no steam, and only requires that the fire be occasionally replenished and bearings oiled.

It does not increase risk of fire or cost of insurance.

It requires less space and less fuel than any other motor of equal power.

It can be used in many places where steam and caloric engines would be inadmissible on account of danger or noise.

The fire can at any time be replenished and inspected without stopping the engine.

Every part of the engine, both internal as well as external, can be reached and examined without the least difficulty.

Hermann Robb, (aged 14 years). High pressure model steam engine and boiler, made entirely by himself. The diameter of the cylinder is 1⅜ inches and stroke 3⅞ inches. Everything connected with it worked perfectly, and reflects great credit on the boy for his knowledge of mechanics and workmanship. Such exhibits should be encouraged, and deserve the highest praise, and if the youths of our city would follow his example and try to do or make something original, the coming generation would be greatly benefited. It might be a good idea, at all industrial exhibitions, to make the work of boys a special feature, giving them a chance to show anything in anyways creditable that they may have constructed in mechanics, optics, etc. The encouragement thus given might lead many to think, to study, to exercise their ingenuity, and to *work*, whose time would otherwise be spent in idleness. By so doing, it is possible that many germs of earnest thought and desire to excel may be planted in the breasts of our youths that will eventually develop into a manhood of fame and usefulness.

H. P. Gregory & Co. Large size Blake's steam pump. (Not in operation.) The most important feature peculiar to the pump is the movable valve face, which takes the place of auxiliary valves in other pumps, and the mechanical connection between this valve face and the piston. The pump is well known and is widely used on this coast for mining and other purposes.

A. J. Smith. Three cylinder pump of a new and novel construction, whereby the water is kept moving in a continuous manner.

The extra power generally used to overcome the *vis inertia* of a column of water after each stroke of the piston, is here avoided. The pump was in continuous operation during the exhibition, and it is to be regretted there were no tests made to show its efficacy.

W. T. Garratt. Hooker steam pumps of various sizes and capacities. Ten of them were in constant operation during the Fair, four of which were nickle plated and otherwise splendidly finished. These pumps are extensively used on this coast. They belong to that class in which the distribution valve is operated by the direct action of the steam upon pistons connected to it. The construction and operation of the engine is as follows: The main steam valve, and the pistons by which it is moved, is the same as in all other engines of this class; alongside of this main valve is a supplemental valve, which covers ports, running to the ends of the steam cylinder for the supply of live steam direct to the main piston, before the main valve has uncovered its steam ports, and also steam and exhaust ports, for distribution to the valve pistons. This supplemental valve is held by a notch in the tappet bar, which lies in a slot covered by the flange of the valve chest, and reaches from end to end of the steam cylinder; at the ends it bears against the cams which are fastened on the ends of stems running down into the bore of the cylinder, to prevent leakage either to or from the cylinder; the cams are fitted to a conical seat, and while being free to turn, are prevented from rising by the flange of the steam chest. The lower end of these stems are turned up at right angles, to form a tappet arm or wiper, which sticks in towards the piston. As the piston reaches the end of its stroke it engages against this arms, and turns it into a recess in the cylinder head. The turning of this stem causes the bar of the supplemental valve to move in a direction contrary to the motion of the piston, reverses the supplemental valve, and by its contact with the cam at the other end, throws the tappet around into the cylinder, ready to be moved by the piston on its return stroke. By moving the supplemental valve, steam is applied to force the steam piston in the contrary direction, though not in quantity to start it suddenly, because of the small size of the port by which the supplemental valve has supplied it. The object of this is to catch the piston and hold it, balanced as it were, against the force of the column of water that the pump is lifting. The valve piston being similarly in balance by the compression of the live steam, starts as soon as the supplemental valve has opened its exhaust by the elasticity of the cushioned steam, and moves until it uncovers the port opening, leading from the supplemental valve, which it had closed when it cushioned on the live steam. It then receives its full supply of steam through the supplemental valve, and completes the reversing of the motion by throwing the main valve to exhaust and supply the main cylinder; as the valve passes to the end of its stroke, it covers the port through which the steam is being exhausted, and at the same time begins to supply live steam behind itself through the port, and immediately cuts off the supply again, and cushions ready for the return stroke. The main piston passes under full supply of steam towards the end of its stroke, and just as it is about touching the tappet, covers the port by which steam is exhausting, and begins to cushion on the confined steam, preparatory to the reception of steam from the supplemental valve.

The working parts are well protected, yet easily reached, occupy small space, and will run very fast or very slow. They have been tried at all kinds of work for a period of years, and give universal satisfaction.

Mr Garratt has the most extensive pump manufactory on this coast, as well as the largest brass foundry and brass finishing establishment, and ever since 1850 he has been one of the foremost in endeavoring to encourage and maintain our home manufactures.

W. C. Wilcox & Co. Four of Wilcox's steam pumps of different sizes. These pumps, the invention of Mr. Wilcox, were taken from the stock on hand, and not made specially for the Exhibition, yet their working parts and general effectiveness were such as to elicit the warmest praise from all, particularly those versed in hydraulics and mechanics. This pump belongs to the class whereby the main valve for the distribution of the steam is operated directly by the steam acting on pistons connected with it. The piston is driven by steam, which is admitted and exhausted through the action of the main valve. This valve is operated by a supplemental piston moving in its cylinder, and the steam to operate this valve is supplied by means of two valves. These valves are placed above and to one side of the steam cylinder, and near the ends. They are made conical, and are fitted to chambers which lie at right angles with the cylinder, so that the spindle or stem of each will extend above the bore of the cylinder.

This stem has an arm or lever which projects downward into the cylinder, and when the piston arrives at one end, it will strike the end of one of the arms, and when it reaches the other end it will strike the other—thus rotating the valves slightly upon their axis. In order to connect these valves, so that both will be moved simultaneously, whether the lever at one end or the other be moved, an arm is provided, which is shown projecting upward from each of the valves, and a rod or bar unites these two arms, moving in a hole or channel under the flange of the valve chest.

In some cases the shaft is extended to the outside of the valve chest, with the arms and connecting bar in sight.

The operation of the pump will be as follows: Steam being admitted to the main valve chamber will fill the space around the valve, and will pass along the channel to the valves, and by its pressure upon their outer ends they will be held closely to their seats. A small slot extends along the surface of the valves to a point where (when the valve is turned to the proper position) steam will be admitted to the port and pass behind the supplemental piston, thus driving it to the opposite end of its cylinder. This movement carries with it the main valve, thus admitting steam behind the main piston, which is forced to the opposite end of its cylinder, when it strikes the arm, and by its movement rotates the valves so as to open the other steam port, and reverse the motion of the piston.

The exhaust ports of the valves are bored directly through the valve, one end connecting with a passage which opens into the supplemental cylinder, while the other end opens into the main exhaust port, so that when one steam port is opened, the opposite exhaust port will be opened. These ports are placed a short distance from the ends of the cylinder in which the valve pistons move in order to give the necessary cushion to the pistons.

It will be seen that the main steam ports open into the cylinder at some distance from the ends, so that the piston in completing its stroke will pass the port, and will be cushioned upon the steam thus confined between it and the end of the cylinder. At the same time, in completing its stroke, it will strike the lever arm at that end of the cylinder, and reverse the position of the various valves, so as to admit live steam to the passage for the purpose of returning the piston.

From its position, however, it will be seen that the steam cannot pass behind the piston until the latter has started on its return movement, and this is accomplished by means of a small port, which opens through the rotating valve, and communicates with the space within which the lever swings. As this space extends to the extreme end of the cylinder, any steam admitted to it will always be behind the piston.

Another exhibit, of Mr. Wilcox's invention, is a deep well, direct acting steam pump, which works by an engine standing perpendicularly over an artesian bore or mining shaft, and working the pump, which is attached to the column pipe, and lowered down the well or mine to any required depth. All the pumps invented by Mr. Wilcox have been successful, and the firm of which he is the senior member is actively engaged, with the best of tools and appliances, in manufacturing them for the market, and for which there is a large demand.

J. M. Keeler & Co. Sluthour Pump. It may strictly be called an oscillating pump. The works are contained in a half cylinder lying horizontal, the length and diameter of which are equal. The suction pipe screws into a stem on the bottom of the cylinder, and directly over this opening is a bridge running lengthwise of the cylinder, dividing the same in two equal apartments, giving an entrance for the water to come in on each side. Over each entrance is an oblong valve, laying lengthwise in the cylinder. The bridge spoken of forms an air-tight partition having a circular groove along the top, and the valve frame covering this half cylinder has two valves, corresponding to the valves below and directly over them, and the axle of the frame works in the said groove. The outer edge of the frame, or valve piston, as it might be called, coming next to the turned cylinder, is packed so that when moved up and down or oscillated by the action of the lever, a vacuum is formed alternately with the rushing of the water out of the opposite side, thereby forming a double acting pump, giving out a steady stream with great force. The Open and Force Pumps are constructed on the same principle.

These pumps were a very attractive feature of the fair, as the immense volume of water raised seemed out of proportion to the power applied. We are pleased to note as a result of their display that many pumps have been sold, especially for irrigating and stock purposes. This speaks well for the pumps and also shows the value and advantages offered by these fairs to bring before the public new manufactures or specialties. This firm also exhibited in operation a Kipp's upright engine. It is claimed this engine has no equal for compactness, workmanship, durability, noiseless action and economy in fuel. Nothing but first-class material is used in its construction. The cylinder,

steam-chest and piston guides are cast solid in the frame, and are both turned or bored out at the same time, and, of course, in the same line; consequently it is impossible for the engine to get "out of true" or to vary from its original exactness in working. The governor is simple, effective and ingeniously connected. This engine is built by machinists in the East of large experience in engine building. The style of frame is both symmetrical and strong, and its lines and proportions bring the whole into a compact form, so that it occupies much less space than is usually the case. (Other exhibits are mentioned in Division 1.)

Volney Cushing. The "Excelsior" hand pumps. These pumps are well and favorably known on this coast as well as the Eastern States, where immense numbers have been sold. Those worked by a hand wheel geared to the plunger were especially noticeable as an easy working pump.

M. C. Hawley & Co. The "Ramsey" hand pump. Meets with much favor wherever introduced.

Holbrook, Merrill & Co. Hand pumps for wells, cisterns, etc.

A. L. Fish & Co. Steam pump (Knowles' patent). This was used as a feed pump for the boilers, and its working was entirely satisfactory, running fast or slow with equal certainty.

Frank Brothers & Co. Agricultural machinery and implements, consisting of one separator, steam stacker, farm wagons, gang plows, cider mills, grain drills, seed sowers, one Hoadley steam engine and Walter A. Wood's harvesting machinery, of which the harvester and self-binder attracted the greatest attention. The binding is done with a No. 21 annealed wire, which is a little finer than an ordinary broom wire. Two arms compress the bundle, while a third puts the wire around the twists or ties it, when it is thrown out by one of the arms and laid on the ground about twelve feet from the standing grain. The binder delivers a bundle every ten feet, but the driver can stop it so as to run any desired distance more than ten feet, until a suitable sized sheaf is gathered.

The driver, without leaving his seat, and while the machine is in motion, can, by means of a lever, instantly move the binder forward or back so as always to have the band in the centre of the bundle, no matter what the length of the grain. The machinery in the binder moves very slowly, so that there is but little friction, and hence little liability to wear or breakage. Should any accident happen to the binder, it can be taken off and the binder's tables can be put on for two men to do the binding. The manufacturers warrant that the five and a half foot cut harvester, with binder, is capable, with one man and team, of cutting, in good workmanlike manner, of fair grain, on fair ground, from ten to fifteen acres per day, and with the six and a half foot cut,

from twelve to eighteen acres per day. A good team is required for fast work, three horses being recommended.

In threshing the grain the wire band is cut and held by the shears that cut it, and is thrown out, or it can be allowed to pass through the thresher and cut with the straw, doing no injury to the thresher, as the wire is annealed and does not break.

Another special feature was the Wood's new sweep rake self-delivery reaper, specially adapted for cutting tangled grain.

D. M. Osborne & Co. Agricultural machinery, consisting of Wheeler's combined reapers and mowers. Kirby's mowers, reaper sections, knives, etc.

One of the machines was run constantly during the Fair by one of Hawley & Co's one-horse power steam engines, and then only requiring one-fourth of its power, although all the attachments were in motion. During the entire time no rattle or sound was heard at the Pitman connections as is with many other machines, which shows the perfection of its machinery and good workmanship.

M. C. Hawley & Co. Agricultural machinery and implements. Buckeye self reapers, separators, French burr mill stones, "Challenge" feed mills, Buckeye drills, "Deere" gang and single plows, Shuttler wagons, Ramsey's pumps, regulator wind mill, "trade" and portable steam engines, scythes, forks, rakes, hoes, etc.

This large and meritorious exhibit attracted much attention from farmers and agriculturalists, furnishing everything required in husbandry from motive steam power down to the smallest hand tool. Buyers at this establishment can be supplied with complete outfits for the farm, and guaranteed first class in every respect.

Linforth, Kellogg & Co. Agricultural machinery and implements. One Chicago Pitts' thresher, with the Lyman self-feeder; one Russell reaper and one mower, one Wood's mower, one Sucker State seed drill, one Dackey fan mill, one corn planter, one cultivator, Fish Bros.' farm "three-spring" and platform wagons, Trust & Bradley's sulky plows and harrows and sulky rakes, Garden City hand plows, Myer's gang plows with dove-tailed share, also hand plows, two of Ramsey's steel amalgam bells, one Mansfield portable engine. Many of the above machines were running, thus giving the general visitor as well as the practical farmer a chance to see in operation the wonderful mechanism and ingenious devices used in their construction. A simple movement or method used for obtaining motion to some part in one of these machines may have, and has in many cases, cost years of study and labor to the inventor.

Donnor & Suhl. Feed cutter and grinder, combined. This is a very easy running and effective cutter, and at the same time can be used to prepare almost every kind of feed for animals. It is the invention of one of the firm,

and manufactured here, and we should think would be a very desirable machine for farmers or stable men.

Palmer, Knox & Co. Golden State Pressure Blower. One of these of the full size, and a small model, were in operation during the fair. The latter furnished the blast for the Pacific Chain Works.

The special improvement in this blower consists in constructing the arms of the two pistons or drivers upon certain peculiar curves, by which they are enabled to maintain a close fit between the circumference of the two drivers, and thus utilize the machine upon blast furnaces, and on other places where a positive force is necessary to procure sufficient blast.

In forming the heads of the pistons they make a wheel or circle, the diameter of which is one-fourth the diameter of the pitch circle. Equal chords are drawn within the pitch circle, forming an exact square. The wheel or circle is placed with its tracing point upon the junction of any two of the chords and is then made to revolve once upon the outside of the pitch circle, when the tracing point will have described the epicycloid required, and will stop at the point of junction of its chord and the next one. The opposite head is formed in the same manner. The sides of the pistons are traced by revolving the above mentioned wheel upon the inside of the pitch circle and upon each side between the termini of the heads, thus forming a continuous circle.

It is found that when a blower of this description is set up, every point of the periphery of the two pistons exactly meet as they rotate, and the fit is so perfect that the machine becomes a pressure blower capable of working against a resistance, without slip or waste.

T. H. King & Co. Blower (The Landis Fan). This was a new and improved rotary hand blower, for general purposes.

Wm. Paddon. Improved mashing attemperator. This machine is one of importance to brewers, distillers, and vinegar makers, its office being to mash or heat the products held in the tubs or tuns, and at the same time give entire control of the temperature of the mash. This machine is constructed of iron tubes, connected in such a manner that a free circulation of steam, hot or cold fluids, can be maintained throughout every part. The rake is arranged to rotate about an upright hollow shaft in the centre of the mash-tun. The upper main horizontal arms or tubes of the rake connect with a hollow upright shaft, about which the rake revolves, so that the steam, which is introduced into the lower end of this upright shaft, will enter the horizontal arms or tubes, and from them enter the tubular rake, where it commences to circulate within the body of the mash and through the machine on its return towards the top of the central shaft, where it connects with an upright tube, which passes upward through the centre of the cover of the mash tun, and has its upper end bent downward, and through which the steam is exhausted into an annular vessel, to be conveyed to any point desired. In converting starch into sugar, the solid and fluid particles must be kept in contact, at a

heat of about 170°. The inventor's method is first to use the machine as a masher only, the machine being put in motion, and the malt and liquor running at the same time and speed into the tun. After being satisfied that the liquor and malt are thoroughly blended, not regarding the diminution of heat, the exhaust pipe is connected and the steam is turned on. The mashing machine now acts upon the goods in its new character of an attemperator, by imparting the caloric now passed into its hollow rake to the mash. By this method the whole of the contents of the mash tun are raised from 130° or 140° to 170° in twenty-five minutes, and are maintained at this heat for any length of time desired, according to the quality of the malt and the discretion of the brewer; thus a principle is carried out on sure grounds, and a rich, brilliant, sound wort, and a large increase of extract, is produced—more than can possibly be obtained by the old process; all other means have totally failed. The inventor has practically and thoroughly tested the power and efficiency of this apparatus, and guarantees its action to be as described. It occupies but little space, is durable, and can be run for many years without repairs. The shaft and arms are of very thick tubes, and the rake is constructed of galvanized iron pipe that will not corrode or rust.

J. E. Perkinson, (Santa Rosa). Flexible harrow, made in three sections connected to a draft bar by links and clevises. This has some advantages over any other harrow, and wherever used gives good satisfaction.

H. S. Craven. Self dumping bucket. This invention will supply a want long felt and needed wherever anything in small quantities has to be raised from below the surface of the ground.

Charles Ellsasser. "Home" carpet beating machine. This is a new invention, and is operated by turning a crank which drives a fan connected with suction tubes, a brush, and beaters having a vertical raise of seven-eighths of an inch. The whole is enclosed in a box about 18x36 inches, set upon castors, and having its lower edge flanged with rubber to prevent the escape of any dust raised by the beating process. The dust is all secured in a recess within the machinery. It can be used in a room without removing the carpet.

J. C. Pinkham. Carpet sweeper. The rotation of the brush in this machine is independent of the rollers on which it rests, and is caused by turning a hand wheel attached to the handle, and at a convenient height from the floor, which at the same time operates a fan that sucks away the dust from the brush and forces it into a bag arranged for the purpose.

Price Press Co. The "Price" hay press, the "Eclipse" hay press, the "Price" box excavator, and "Price" draper excavator. All the above machines are the invention of Mr. Jacob Price, and are manufactured at San Leandro, Alameda County.

The Price Press. Has stood the test of practical work in this State for a number of years, and has been pronounced wherever used, to be the most effective and economical press yet invented. The average amount of hay that can be baled per day by a No. 3 press, is fifteen tons.

The Eclipse Press. Is a new invention of Mr. Price's, and is manufactured for both hand and horse power. They are adapted to a great variety of work, such as baling hay, cotton, wool, hair, moss, rags, scrap metal, etc. The power is obtained by a screw and toggle joint, a simple yet most effective arrangement, giving unlimited pressure. The press is entirely devoid of pulleys, ropes, chains, cog wheels, springs, belts, or triggers of any kind, and the working parts being nearly all of wrought iron, cannot break or get out of order.

The Box Excavator. Or self-loading grading cart, is an invention specially adapted to the following kinds of work: for making cuts and fills on railroads or canals, or for excavating canals, for building levees, reservoirs, dams, embankments and common roads; for grading lots and grounds, excavating cellars, etc.; in fact, for any purpose where it is necessary to move earth from fifty feet to a half a mile.

It is totally unlike other machines made for a similar purpose, differing from them widely in principle, construction, appearance and operation.

It is, in fact, a three-wheeled cart, the box being hung low down between the two hind wheels.

The forward wheel is a caster wheel, turning freely in any direction, and allowing the machine to be turned around in a circle ten feet in diameter.

All the wheels are wrought iron, with cast iron hubs and steel tires, and with the exception of the "off," or right hind wheel, have nothing peculiar about them. The one excepted, however, has a tire twelve inches wide and five-sixteenths of an inch thick, with the spokes set well over the outer edge of it. The inside of the tire is divided up into buckets or pockets, by blades of iron about ten by twelve inches, one of which is bolted to each spoke. Beneath the box, and just inside of the elevating wheel above described, is an ordinary plow, throwing its furrow on the inside of the wide tire into the above mentioned buckets, and by it carried up and emptied into the earth box.

At the top of the earth box is a horizontal distributing wheel, driven by the spokes of the "near" hind wheel. This wheel serves to keep the earth level, and make it fill the box chock full in every corner.

The load is discharged by turning the three botton planks on their edge, by means of a lever on the left hand of the driver.

A lever on the right, raises or lowers the plow.

The elevating wheel and the "off" horses travel in the furrow. The driver lowers the plow, and the box commences to fill, requiring less than a minute to take in a full load. When the box is full the plow is raised, without stopping the team, and the load is driven where it is wanted, and discharged in one second, also without stopping. Indeed, there is no necessity of stopping during an entire day's work, either for loading or discharging.

There is not a belt, draper, carrier, cog-wheel, clutch, rack nor pinion about the entire apparatus, and nothing to wear out except the plow share. The whole machine, except the earth box and tongue, is of iron and steel, and although stronger than required, is yet light and graceful in appearance, the two yard machine weighing a little over 2,000 pounds, and the one yard machine weighing about 1,400 pounds, and running so easily that one man can pull it anywhere on level ground.

It requires four horses for a two yard machine, and two for a machine carrying one yard.

The Price Excavator, with Draper. Is designed for building canals, levees, turnpikes, and loading carts or wagons. The machine requires one man and four horses to operate it. It is similar to the other in operation, a plow ten inches wide, and running two to three inches deep being used.

The elevating wheel and the other hind wheel are each six feet in diameter. The forward or caster wheel is two feet six inches in diameter. The tire of the elevating wheel is of steel, five-sixteenths of an inch thick by twelve inches wide. Bolted to each of the spokes is a blade of iron eight by twelve inches, which forms a series of buckets completely around the wheel on the inside of the tire. The spokes of the wheel are set even with one side of the tire, so that a draper can be projected far enough under the buckets to receive their contents. The buckets are set obliquely across the tire, so that they will hold the earth till it gets near the top of the wheel. A segmental shield also assists in preventing the discharge of the dirt till it arrives at the apron or draper.

The side-pieces of the carrier frame are iron pipes, the outer half sliding into the other portion like a telescope; there are also screws at the outer end by which the outer carrier roller can be moved out and in, to compensate for the expansion or contraction of the draper. The draper is thirty inches wide and is made of 12—0 duck, the same as that used for making hydraulic hose. It is almost one-eighth of an inch thick. A bevel wheel 24 inches in diameter is keyed on the hub of the elevating wheel, and turns a short shaft leading to the inner draper roller, which being thus caused to revolve, gives motion to the draper or carrier. The draper runs once and a quarter as fast as the horses walk. The plow which throws the earth into the elevating wheel is directly in line behind the "near" horse, and is so located that it will plow close up to a vertical wall, thus enabling the machine, when used for canals, to make the banks perpendicular, if required, or slope them at any angle.

The weight of this machine is nearly 2,500 pounds, depending somewhat on the length of draper used, as it is necessary to carry a little weight on one side of the machine to counterbalance the weight of the draper, and, of course, the longer the draper the greater the weight required. The two hind wheels are four feet six inches apart from centre to centre.

Labor-saving machinery of the class above described is of the utmost importance to the future of our State, and when successful should receive the highest commendation.

A. S. Hallidie. Grip pulley. This devise consists of a series of clamps or grips cast in two pieces, and whose interior line resembles a groove. They are arranged on the periphery of a wheel and held in place by the rim, one side of which is cast separate and bolted on after the grips are put in place, recesses for the same being cast in the rim. When pressure is made on the bottom of the grip, by its peculiar construction and bearings on the rim, it clasps the rope with force in proportion to the weight applied, but returns to its normal position when the pressure is removed.

It is specially applicable to the transmission of power by ropes, or in elevated tramways for the conveyance of ores, etc. It has been used with great success by the inventor and others in this State, Nevada and Utah.

Wm. R. Stearns. The Hercules lever jack. This is a new and effective machine, whose simplicity, power and cheapness commends them for general use. The lifting power is obtained by a lever with pawls attached, that at each movement catch in a rack attached to the lifting column in the centre. By an ingenious arrangement the load can be lowered by the same movements as it is raised. It is also arranged to lift from the bottom, and is well adapted for cider, wine, cheese, cotton, or hay presses.

W. T. Garratt. Improved lifting jack. The lifting power for this jack is applied by a rack and pinion, which gives a positive, steady motion, either raising or lowering. It is made entirely of iron and steel, compact, and not easily broken.

Joshua Hendy. Power lifting jack.

M. G. Griffin. The Bickford family knitting machine. There seems to be no end to the articles that can be produced on this machine, and wool, cotton, linen or silk can be used with equal facility. A very useful and ingenious invention.

Pendleton & Co. "Champion" sewing machine motor, for sewing machines or other light machinery, and is specially adapted for running small lathes for jewelers or dentists.

It is well-known to all, that the crank of a sewing machine is difficult to set at rest in any position except directly up or down—on the centre, in fact. Then, to start the machine, one has to use the hand to impart circular motion until the feet get a chance to make a down pull on the crank. This is very troublesome and wearying, and has been sought to be averted by the rocking motion of the foot pedal, whereby they could push on the crank as well as pull. In this invention the pedals are connected by a band that runs up over an eccentric pulley connected with the main drive wheel, then down around a small pulley and over an eccentric on the other side of the drive wheel, down to the other pedal. The feet are moved alternately, and the band plays back and forth. It is impossible for the machine to start the

wrong way, and the least movement of the foot gives motion to the machine. No brake is required, as the motion is entirely controlled by the feet, and the hands are at all times free to adjust the work.

C. R. Sykes. The Hall treadle for sewing and other machines. For some years physicians have urgently insisted that the use of sewing machines was directly the cause of ill health.

The theory advanced by medical men is that the constant working of the hip joint and lower part of the body necessitated by the heel and toe motion of all sewing machine treadles, induces complicated diseases that are harder to treat and more health-destroying than ordinary forms. The Hall treadle remedies this entirely. The foot and leg below the knee only is brought into action. The foot-piece works from the heel as a pivot or joint, the knee scarcely making the least raise. The motion is communicated to the machinery by what is called the "pawl and gib," which completely does away with the crank and consequently renders it impossible to start the machine the wrong way. Each foot works independently of the other. Any child can run a sewing machine with this treadle, from the slight motive power required and the instantaneous effect of the break that goes with every treadle.

Mark Sheldon. The Davis sewing machine.

W. B. Fry. The Domestic and Grover & Baker sewing machines; also paper patterns and paper trimmed suits, for which see Division 9.

Samuel Hill. The Florence sewing machine.

C. P. Sykes. The Home & Home shuttle sewing machine.

H. R. Ames. The Howe sewing machine.

G. A. Norton. The New Wilson sewing machine.

W. F. Fonda. The Wheeler & Wilson sewing machine.

E. B. Cutlar. The Wilcox & Gibbs sewing machine.

R. H. Yates. The Singer sewing machine.

At no previous Fairs of the Institute has there been such a varied and comprehensive display of sewing machines and sewing machine work as there has been at this. As each machine has some part differing from the rest, and the agents generally claiming that the machine they represent is superior to any other, it would be invidious to particularize any one of them.

The sewing machine business has assumed proportions that seem almost incredible. Yet when we think that only a few years ago the article was con-

sidered a luxury, and only found in the homes of comparative wealth, is now felt to be a necessity, and by the liberal terms of the companies is found in almost every household, however poor or humble, we do not wonder at its magnitude.

Osborn & Alexander. Foot lathes, foot jig and circular saws, with Barnes' patent treadle attachment, also foot power mortises. By the aid of these valuable and ingenious machines, a vast amount of labor and time can be saved in ordinary labor where they can be applied; while for ornamental and fancy work they furnish the means to produce an almost endless variety of fancy articles for use or decoration. No better gift could be given to a boy of a mechanical turn of mind, than one of these lathes or jig saws, as their use would train the hand, and the desire to "make something" would develop the inventive faculties.

I. H. Small. Wood surfacer. This was a most meritorious exhibit of home manufacture, containing all the late improvements in wood planers. It has a solid cast iron frame, improved feed rolls and cutters, planers, 24 inches wide, and arranged for working rustics. Mr. Small has extensive works and makes a specialty of wood-working machinery. He also exhibited a Shingle machine, very compact, and said to be rapid cutting and effective. It is built with a double carriage, and fed at both ends, by which arrangement the saw is made to cut on both sides. The work is delivered at each end.

Potter & Bailey. "Dicey's" patent gang edgers, Mackey, Walker & Co's gang lath machine and lath binder, saw gummers, etc. This firm are agents and manufacturers of the above and other wood-working machinery. Most of their exhibits were running and attracted much attention.

Wm. Gooding. Olney's champion saw filer and gummer. This machine is of a new and novel construction, having a universal motion of the arm that carries the wheel, yet so arranged when adjusted, as to only cut to the exact point desired. The brilliant shower of sparks thrown from the wheel when in operation, always drew an interested audience.

F. A. Huntington. Shingle machine, of his invention and manufacture. These machines are extensively used throughout this coast, and give the best satisfaction. He makes a specialty of saw mill machinery, and the improvements he has made are particularly applicable to the wants of this coast, so that his machines are preferred to those of Eastern manufacture.

M. C. Hawley & Co. The "Perpetual" Baling Press. This is a somewhat complicated arrangement of the mechanical powers for the purpose of baling hay or other materials. A strong plunger has a reciprocating motion in an oblong box, into which the hay is fed, and by successive blows of the plunger is compressed into a very compact mass; in girth the size of the box,

and any length desired. The plunger can be worked by horse or steam power, the necessary movement being given by a very ingenious mechanical device. Its size and weight would preclude its general use in many localities.

W. I. Tustin. Exhibited three horse-powers and one windmill. The "Eclipse" horse-power is a one-horse double geared machine, the tumbling rod making thirty five revolutions per minute; very strong and weighing 800 pounds.

The "Economy" is a strong and very compact machine, geared internally, and the gearing all covered up by the main drive wheel, which forms a cap over all, and the shaft makes fifty revolutions per minute. It weighs 900 pounds, and is calculated for one-horse or light two-horse work.

The "Eagle" is a two-horse power, very strong and close built, with internal gearing, and engages two pinions, and they break into a center pinion and bevel gear. The main wheel forms a cap over all, and engages three times the usual number of teeth. The shaft is supplied with two sweeps.

The windmill was a model of the large size that is used extensively throughout the State, and particularly by the Central Pacific Railroad Company.

Mr. Tustin is one of the earliest of the pioneers of this State, and for many years has made the invention and manufacture of the above machines a specialty. They are strong, durable, constructed of the best materials, and on scientific principles are fully warranted in every respect.

W. C. Nelson, Vallejo, Cal. Patent Windmill. This mill contains a number of new and ingenious devices for regulating the speed and insuring safety, whatever may be the force or direction of the wind.

E. O. Hunt. The "Centennial" windmill. These mills are the invention of Mr. Hunt, who makes a specialty of their manufacture. He has been engaged in the business for many years, and the regulator of his windmills shows which way the wind blows in almost every part of this State.

J. N. Rundle. The Eureka Horizontal Windmill (model). This mill is a recent Californian invention, and probably different from anything before invented. The plane of the wheel or fans is horizontal, their ends being fan shaped and pivoted at the ends. A series of cams are connected with them, and so arranged that during a certain part of a revolution they will be in position to receive the full force of the wind, they then turn their edges, which offer but little resistance to the wind. A vane keeps a certain point, always to the wind. So much motion in the fans makes it of doubtful utility.

A. H. Southwick. Turbine windmill (model). This mill is different from any other on exhibition. The wheel stands perpendicular, the weight resting on a steel point, thus reducing the friction to the least possible amount. Outside of the wheel is a series of shutters that open or close automatically,

admitting just wind enough to do the work desired. They are self regulating, and there is no possibility of their blowing to pieces, as in case of a gale they close up entirely. A slight breeze will keep them in motion, and they are always in position, as it receives wind from every quarter alike. All the machinery is under cover, and they can be made or finished architecturally to correspond with surrounding buildings.

J. E. Holloway. Automatic or compressed air pump and wind wheel, manufactured by Hartford Pump Co. The principle of this pump is compressed air, conveyed by pipes from the pump to any distance, and then by acting directly on the water by pressure forces it to the surface. It is claimed that, with this invention, in raising water from a deep well much power and expense can be saved, compared to other methods.

M. C. Hawley & Co. The "Regulator" windmill. This mill has a very novel and ingenious device for preserving a steady motion whatever the strength or direction of the wind may be.

Berringer & Co., San Jose. Portable mill. A small, compact, and very useful machine for the farmer or stock raisers.

David B. James, Visalia. Improved one rail railway and car. The invention consists of one line of broad-faced wheels in the center to carry the load, and guide-wheels to run each side of the rail on vertical axles projecting down from the car, the wheels being to keep the carrying wheels on the track and to prevent the cars from overturning, for which they are contrived to gripe the rail with more or less force. The wheels are connected with a platform which is carried only enough higher than the rail to clear it properly, and the car is mounted on pivots arranged in the line of the wheels and supported on the platform so that the load is evenly balanced on the wheels and the centre of gravity is lowered as much as possible to prevent overturning. The guide wheels running against the sides of the rails are contrived to move forward and from the rail, and provided with springs to keep them in contact. In the locomotive they may be geared with the power, and have a lever contrivance for gripping the rail tightly for traction on steep grades.

As only a large size model has yet been made and exhibited, its practical working is not yet demonstrated.

Prismoidal Railway and Car Co. Full size car and section of railway. A cross-section of this track would be a prism, say, whose sides were 24 inches, and laid on ties and spiked down. The upper angle is cut or left off, so as to give a flat bearing five or six inches wide, which may or may not be covered with an iron rail, and on which runs two wheels that support, and are attached to the car. On each side, and near the outer edge of the bottom side of the car platform, is attached two guide wheels, and set at such an angle and distance as to rest against the sides of the prism, midway between the base

and the upper flat portion. If the car was exactly balanced, the guide wheels would sustain no weight; but as that cannot be, they at times take a portion of the weight as the car tips or rounds curves.

The railway can be made entirely of wood, and we believe a line is already, or soon will be, in operation in this State, when its merits will be fully tested.

Prescott, Scott & Co. A small five stamp quartz battery complete. This was a very instructive exhibit to those who never saw before the method used to pulverize our gold and silver ores.

Stephen Kendall. Quartz mill. The stamps in this mill are attached to the end of curved arms that have a quick reciprocating movement from cams on a shaft that is part of the machine. Each revolution of a cam gives two blows from a stamp, and the number of stamps is only limited by the size of the mill. It was not in operation, therefore we can say nothing regarding its value.

F. Ogden. Tullock's automatic ore feeder. These machines are direct acting. The back of the hopper has an adjustable scraper, and at each motion of the tray a portion of the ore is scraped forward to the battery. They are certain in action and it makes no difference whether the ore be wet or dry, as the machine will feed everything that has consistency enough to be scraped.

These machines save all hand labor in feeding the battery, and perfect control is had over the feed. By actual test the increase in ore crushed when fed by this device, instead of by hand, is said to have been two and a half tons to each five-stamp battery in 24 hours. It is claimed that they will save more gold than by hand feeding, owing to the regular, steady feeding and overflow of pulp over the plates, with no scouring of plates or loss of amalgam. The bulk of the gold is amalgamated in the battery. The Tulloch machine is so constructed that the drop of the stamps feeds the ore in just such quantities as the stamps require. Each drop regulates the supply required for the next drop, whether it is more or less, and this is the true principle of an automatic feeder. The tray moves longitudinally, and a stationary scraper forces the material forward at each backward movement of the tray, thus insuring the perfect feeding of all classes of ore.

Joshua Hendy. One large engine lathe, one iron planer, two Hendy's concentrators, and one $1,000 Challenge Ore Feeder. Of the latter machine, it is claimed by the inventor, that it is now fully demonstrated by long and continued experiments, that the plan upon which a perfect ore feeder must be constructed is that of the *carrier*, and not that of the shaking table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply *dropped*. Spasmodic or jerky contrivances will not answer the purpose.

The principle involved in this machine is a revolving table on which the ore for the batteries falls by its own weight from the ore bin. The table is turned by suitable mechanism attached to the stamps, that operates it only when rock is needed beneath them. A scraper placed diagonally across the table causes the ore to fall into the chute whenever motion is given to it.

HENDY'S AMALGAMATOR AND CONCENTRATOR. Is operated on the principle of centrifugal force and gravitation combined. Over five hundred of these machines have been sold and put to use on this coast, which is the best evidence of their value and successful operation.

C. P. STANFORD. New Ore Feeder. This machine belongs to the class of ore feeders sometimes called carriers. It does not feed by a jar or shake of the ore, but it draws the ore forward in a compact flow, and drops it little by little into the battery as required. The throat or opening from the hopper is seven inches deep by twenty-four inches wide, but the flow thins off towards the front edge to three or four inches deep by the same width, and delivers the feed to the three middle stamps—the middle stamp of the battery being the "feed-stamp. The hopper has three vertical sides, only the back being inclined so that there are no abutments for arches to be left standing, by drawing out material from under, as would be the case if the sides were converging.

There has been on exhibition now for two seasons, a handsomely made and complete battery (Prescott, Scott & Co's five stamp), in operation and fed by one of these machines. Of course, under the circumstances, it was impossible to develop its full range of capabilities, but an inspection of the machine at work brings to view: 1st, That it responds promptly at a touch of the tappet on the feed-rod. 2d, That it is simply having only two bearings, the motion of which is so slight ($\frac{1}{56}$ *part of an inch*), that no oil need ever be used. Nor has it any working joints. 3d, It has no lost motion; and 4th, It is very compact and little in the way about a battery.

About twenty-five feeders of this kind are now at work, feeding wet or dry, coarse or fine, requiring but little attention and slight repairs.

M. GUERIN. Irrigation meter. This invention is designed to regulate the flow of water from a ditch or canal, so that an even flow from the distributing pipe will be kept up, whatever the pressure or height of the main body may be.

We think its expense would be a bar to its general adoption.

LYON & Co. Ice machine. This machine, invented and made in France, consists of a horizontal cast iron cylinder, lined with lead, and containing eight pounds of sulphuric acid. At one end of cylinder is connected an air pump, 1½ inches in diameter, and 13 inches stroke, worked by hand. Connected with the lever of the pump, is a suitable device for agitating the acid;

at the other end of the cylinder are two pipes, arranged to connect two decanters, holding each about one and one-half pints of water. The operation of the air pump exhausts the air from the water in the decanters, and passes the same over the sulphuric acid into the air. The continuous operation of the air pump for eighteen minutes, produced sufficient ice in the decanters for all drinking purposes. This machine, as exhibited, is suitable only for making ice water.

California Electric Power Co. Telegraph and electrical instruments, isulated wire, batteries of all descriptions, burglar alarms, electric annunciators, and other apparatus; also, the gongs, batteries, etc., in use at the Pavilion. This firm only commenced business last May, yet have already done a large amount of work for public and private houses and institutions.

There seems to be no limit to the uses to which electricity may be applied. Thought, that once could only travel with man, now goes as the lightning's flash. From end to end of our city, across continents, beneath the ocean, and over mountains, runs the slender wire on which flies, at the will of man, an intelligence that can knock at a thousand doors as it goes, and tell its tale for good or evil. In our offices and households hangs a little unobtrusive dial, yet within it lurks a subtle messenger that a simple touch of the finger sends forth to those that are waiting to do our bidding; high up on storm beaten rocks, in the light house tower, it gleams through the night, bright as the sun's ray, to guide the passing ship; and down in the dark mine where the black powder lies, and death and danger lurks, it goes where man dare not and fires the blast that makes the earth tremble. It turns the wheel, it searches the body for disease, it pleases the ear with music, and in a thousand ways has become useful and necessary to man, and still discoveries go on and the end is not yet.

St. Ignatius College. St. Ignatius College philosophical apparatus. One of the most prominent and attractive features of the Exhibition was by universal consent this display of a large portion of the scientific apparatus of St. Ignatius College, and the exhibitions of electric light and other physical experiments by the Rev. Father J. M. Neri, S. J., Professor of Natural Philosophy of that institution of learning.

The more delicate portion of the scientific instruments, neatly arranged, labelled and classified under their proper departments, was exhibited upon shelves entirely encased within a glass enclosure 32 feet long, 12 feet wide, and 12 feet high. The larger and heavier portion of the apparatus occupied an open space contiguous to the glass enclosure.

The selections comprised instruments from all the departments of physical science: from mechanics, hydrostatics, pneumatics, acoustics, heat, optics, spectroscopy, magnetism, frictional and voltaic electricity, and meteorology, as may be seen from the Catalogue of the Exhibition. Conspicuous among these philosophical instruments, and worthy of particular mention, were the following:

In the mechanical department, very fine physical and chemical balances.

In hydrostatics, Venturi's apparatus to illustrate the laws of flowing liquids; Colladon's, Hero's and intermittent fountains; the various kinds of pumps in glass; an hydraulic ram, also in glass; and a powerful, though small, hydraulic press, capable of exerting a pressure of 5,000 pounds.

In pneumatics, a fine and very large air pump, with all appliances and accessories, and a magnificent Sprengel mercury pump for perfect vacuum.

In acoustics, the modern improvements of the apparatus of Latour, Melde, Konig, Chladni, Savart and Helmholtz. Also a colossal model in sections of the human ear.

In the heat department, pyrometers, eolipiles and thermoscopes of various kinds; the apparatus of Gay Lussac, Boutigny, Ingenhousz, Breguet, Leslie, Rumford, Carré, Tyndall, Regnault and others, including the recent machines to manufacture ice, both by the ammonia process and by the evaporation in vacuo; the new Rider compression engine, and steam engines of many varieties.

In magnetism, frictional and voltaic electricity, a complete assortment of what can illustrate the latest discoveries, including Holtz's and Carré's electrical machines, large and small induction coils, galvanometers, electro motors, batteries, magnets, electric machines, vacuum tubes, thermo-electric batteries of great power, and telegraphic and signalling instruments of all kinds.

The optical apparatus, the most remarkable of all, included with the rest a great fresnel lens over two feet diameter; a number of electric light regulators, instruments for the study and for the projection of polarized light, of diffraction, phosphorescence, and fluorescence, spectroscopy, and all other optical phenomena; telescopes, reflectors, photometers, lenses and prisms, of great variety and for different purposes.

The appearance presented by the display of such a numerous, elaborate and costly apparatus was quite imposing, grand and pleasing in the extreme. Having been mostly manufactured to order for St. Ignatius College during the last six years, it is quite new, fresh, and of modern construction, and not only highly finished but well adapted to the work required of it, both for class and lecture demonstrations, and for research and investigation.

The largest portion was constructed in Europe, mostly in France, by Duboscq, Ruhmkorff, Carré, Alvergniat, and others; but whatever could be procured at home was preferred to what could have been imported from abroad. Among the pieces of American make are the large induction coil, by Ritchie, of Boston; acoustic, electric, and spectroscopic apparatus, from Philadelphia, New York, and St. Louis; the large pneumatic machine by Roach of San Francisco; all the telegraphic and signaling instruments from the Electrical Construction Company of this city, besides many minor pieces and improvements made in the college laboratories.

Many of these philosophical instruments were occasionally shown in action during the exhibition; among them, the steam engines, the hydraulic ram, the air pump, Barlow's wheel, vacuum tubes on rotators, the hot air motor, the electrical locomotive on its rails, various other electro motors, both by means of galvanic batteries, magneto-electric machines, and thermo-electric

batteries; but what attracted the attention above all were the exhibitions repeatedly given of inductive electricity, and those of the electric light, given two evenings every week.

The wonderful power of the large inductorium was shown under the most various circumstances, in air and in vacuo, in gases and vapors, in sparkling tubes, panes and jars; under the action of magnets and of condensers, with different interrupters, and through a most gorgeous array of from twenty to thirty feet of the most exquisite Geissler tubes in existence, exhibiting charming effects of varying colors, of fluorescence, phosphorescence, and stratification of the electric discharge in rarefied air, gases, vapors and solutions.

The electric light was supplied by the large magneto-electric machine, driven at 500 revolutions per minute by a ten-horse power steam engine. A remarkable modification lately introduced in this apparatus by the exhibitor, Rev. Father Neri, and tried for the first time on this occasion, more than doubled the light originally produced. The improvement consists substantially in passing currents around new coils made to encircle the permanent horseshoe magnets, whereby these are greatly strengthened and kept up to the highest point of saturation, thus adding to the steel magnets the advantages of electro-magnetism, and producing in the revolving bobbins much stronger currents. The light obtained from the machine thus improved was powerful and brilliant beyond expression. Concentrated by reflectors, and thrown around the immense pavilion, it lighted up objects and persons as a ray of solar light. No human eye could safely gaze on the dazzling beam. It paled the hundreds of gas jets burning in the hall, and by the interposition of glasses and optical contrivances it produced the most varied and surprising effects, especially when projected on the large water jet of the central fountain. Projections on a screen fifteen feet from the luminous point were clear and brilliant, though the pavilion remained illuminated by most of its usual gas lights. It was ascertained that the electric light was equal in intensity to the joint lights of ten to twelve thousand standard candles.

When the current from the magneto-electric machine was passed through platinum wires, stretched across the elevated platform, from which the electric light exhibitions were given, very remarkable effects were produced by raising them to a white heat, and thus rendering them quite conspicuous at great distances. The power of the current was such as to keep a platinum wire .035 inch in diameter, and six feet long, at a white heat for any length of time, and occasionally even melting it altogether.

These scientific exhibitions, both of the magnificent philosophical apparatus and of the illustrations and experiments ably conducted by Rev. Father Neri and his assisting pupils on such a large scale, proved eminently interesting to all classes of people. Thousands of visitors, who, unaware even of the existence of such means of knowledge and scientific information, could not but derive much profit and advantage from such display. No doubt the exhibit contributed much towards the success of the Eleventh Industrial Fair.

We may well congratulate ourselves for possessing within our midst, in this young city and state, such facilities for scientific education as St. Ignatius College affords to our rising generation, and such a cabinet of philosophical apparatus, second to none in the United States.

DIVISION VII.

Wines and Liquors.

No interest in the State can excel in importance the wine interest; that is, the importance which it may in the future be made to assume. The greater part of all the countries of the world can produce wheat or wool, or other staples that California is pre-eminent in, but only a comparatively limited part of the earth's surface may be made to produce wine. The greater part of North America, of Asia, Russia in Europe, North Germany, Great Britain and Ireland, and some of the hotter countries of the world, cannot produce the vine in perfection, so as to allow of good wine being made from it. All the countries have therefore to import their wines from abroad, and the number of countries from which they may import them is limited, as many wine producing countries make no more than is needed for their own consumption, and some not even that. There is at present only one great wine exporting country in the world, and that country, France. Most French wines are high priced, and not therefore suitable for consumption of the majority of the people that would use them; so that a fine market, and that market the world, is offered to that people who shall produce a good and cheap wine. The consumption of any article is directly proportioned to the price of it—if the price is moderately low, it is large; if it is high, it is restricted. If, therefore, California can produce good and cheap wines, she has an illimitable market for them, and then before the importance of the wine product, that of the gold, silver, wool and wheat of the coast aggregated may pale their ineffectual fires.

France, as we have noted, sells high priced wines, yet the grape and wine crop of France is the greatest of all her crops in value; is greater in value than all her other agricultural products; greater in value than any of her manufactured products, important as so many of them are. It is worth annually two hundred and fifty millions of dollars. It paid the French indemnity, and left France stronger and richer than her conqueror, still *La Grande nation* of Europe. There is nothing chimerical in looking forward to a similar future for California, so far as the industry is concerned. It has already taken deep root in the State as a leading industry, and wine is looked upon throughout America as a distinctive Californian product. Ripened well by our long dry summer, the grapes grown on our hillsides are far better fitted for producing that Olympian nectar, which gladdeneth the heart of man, than are that of any other portion of the United States, save perhaps New Mexico and Arizona.

The quantity of land in the State suitable to grape growing is very great; not less than 30,000,000 acres, large tracts of which are unfitted for anything except grape or fruit culture. Hillsides, that to the ordinary agriculturalist filled with the traditions of centuries garnered in other lands, would seem desert, barren and wild, are to the skilled viniculturist full of promise, and

when covered with gaily trellised vines will, so far as financial results are concerned, leave the richest soil of our rich valleys far behind.

The fostering of the wine interest of the State is, therefore, one of the most important duties of the merchant, the legislator, or the directors of an institute so intimately connected with all the great industrial interests of the land as this is.

Hence the wine section—for there should be a wine section—should possess an interest equal, if not superior, to that of any other. Under able management it should be one of the sights of the Exhibition, and would be visited by scores of representatives of Eastern and foreign houses, whose reports would be followed by the opening up of new markets of greater or less extent. There exists a fine field for the introduction of California wines not only to the public of the United States, but to the people of a great part of the world. The greater part of the foreign wines now imported into the United States, and the greater part of wines imported into other countries, are largely adulterated in a great number of cases, perhaps so much so as to be prejudicial to public health. The work of superseding these wines by the pure juice of the grape ought not to be one of any exceedingly great difficulty, and duly accredited by the officers of an institution such as this, our wine makers would find many obstacles easily removed from their path. Such credentials would do much to counteract the antagonistic influence exerted by such as they who in Philadelphia lately exhibited such an antagonism to the wines of California.

The wines exhibited at the late Fair were sent there by five of the principal California wine houses of the coast, almost equally noted as grape growers and wine makers—one of them being the oldest firm of wine manufacturers on the coast. They consisted of varieties bearing more or less resemblance to the famous wines of Europe, and for the most part known under similar names. Champagnes, ports, sherries, clarets, hocks, of the finest kind, were there, challenging comparison with the finest wines of their class produced in Europe, though, of course, they lacked the bouquet and aroma imparted by age. There were there ports, sherries and champagnes far more worthy of the place of honor on the hospitable board than the tinctured imitations that but too often assume the name of these famous old wines of Europe.

If wine gladdeneth the heart of man it was surely wine like this—the genuine juice of the grape which supplies all the necessary tone to the system, and which, where it is in common use, the era of drunkenness is almost wholly unknown. There was present, also, the famous Golden Wine of San Mateo, which has obtained for itself a local habitation and a name as amongst the most famous wines of California, and thus forces upon us the conviction of how much better it would be for the wine makers of the coast if they adopted some such happy titles for their wines instead of christening them by European names, chosen from fancied resemblances in appearance and taste. The term Golden Wine is sufficient to sell wine, bearing it almost any where, even in the heart of the best wine districts of France, where California Ports, Sherries, etc., are apt to be confounded with European Ports, Sherries, and to lose their individuality as California wines, and suffer

in their sale accordingly. We confess we like the terms Golden Wine, Mound Vineyard, Catawba, Gerke, Landsberger, Perle de la Californie, etc., and the public like them, too, and there is everything in a name. Who does not feel his imagination fired, and every particle of poetry in his being waked into life, at the mere mention of the names of the glorious wines—the product of the sunny shores of the Mediterranean, the land of beauty and song. A good name is a passport everywhere, and if California wine growers are wise, they will give good names, new ones, and racy of the soil, to the product of the vineyards, and then they will become known and appreciated in every land in the world.

The history of the grape in California is that of the history of Caucasian settlement, civilization, and religion in the land. A hundred years ago the native grape, better known as the Mission grape, was introduced by the missionaries, and ever since has flourished. From it the Fathers of the Mission and the early American settlers made wine, and it is now used largely for the same purpose. But when the wine industry began to assume some prominence amongst us, and it became certain that California was about to become a wine country, a commission of experts was sent to Europe, and the first varieties of European vines were introduced into the State. The result of this wise action is now seen in the fine wines produced by us, and in the pre-eminence gained by the California product, almost as it were at a single bound. For many years, indeed, the growth of the industry was slow, it being regarded more as illustrative of the great variety of products that the State could boast of, than as the foundation of an overshadowing interest of the land. In 1859, the whole product did not exceed 100,000 gallons, of which about one-third was exported, and many years passed away before it really increased. Three years subsequently, the yield if anything, declined, and it had not properly recovered itself till 1863. The next year it again declined, and so it continued for several years more, advancing and declining, till it reached about half a million gallons in 1869, and since then it has rapidly increased year by year as the new vines planted came into bearing. In 1872, the export reached 1,000,000 gallons, and since that time the product has largely increased. Several causes have interfered with the marketing of California wines for the past two or three years—the want of agents in the East, the comparatively small quantity produced, and the business depression throughout the Atlantic States. Some of our wine growers have agents in large Eastern cities, and one of them went East last year himself to lay the proper foundation for a trade, but this has not been generally the case, and there are thousands of towns and cities where such a thing as California wine is not known. Various bogus descriptions of most, bearing the name, have been sold here and there, and this has injured the name of our wines, and created a dislike to them in the minds of people who have been thus unknowingly imposed upon. Then the great variety of brands existing, and the lack of large quantities of each, have deterred European buyers from purchasing them to mix with other wine. The business depression in the East has materially affected the sale of necessities, and much more so of luxuries, during the past three years. California wines have been there

regarded, in particular, as a luxury, and the people, besides, not being habituated to their use, they will have suffered in the midst of general depression much more so than that of other superfluities. But now that the depression has about passed away, and that they are becoming better known, we may anticipate better results than hitherto, and calculate on the placing of several millions of gallons yearly in the markets of the East alone.

During the past year there have been several experimental shipments to England and Germany, and should the impression produced be good, we may calculate on large shipments to these countries also; in fact, it does not now seem as if there would be much difficulty in placing the prospective large product of the State for several years more, especially as there is a fast increasing local consumption, and there will be an increasing quantity needed every succeeding year for consumption at home. The forced retention of large quantities of wines in the hands of our growers for the past two or three years is not an unmixed evil. As wine improves with age, and as it commands a price in the markets of the world proportioned to such age, the inconvenience felt by many financially will be more than repaid by the increased prices which it will bring in New York, Chicago and St. Louis. The opposition manifested to California wines by interested parties at the Centennial will not work much to their injury, as the motives of these gentlemen are well understood and appreciated, and as the hundreds of thousands who went to Philadelphia had and still have an unequaled opportunity of seeing and judging for themselves, and through these visitors the fame of the product of the California grape will be carried to hundreds of places that, it is safe to say, never heard much about it before. And with this, and the establishment of small agencies all over the country, it is safe to predict that within a very few years the California wine would become the beverage of the country, supplanting Bourbon straight and lager. We shall have to make more than ordinary efforts to get rid of our surplus of wine. The whole crop has increased steadily year by year. Last year it equaled 7,000,000 to 8,000,000 gallons; this year it will equal 10,000,000 gallons, or exceed it, while in 1877 it will probably be 12,000,000, and still as new ones come into bearing will be greater still. There is hardly a county in the State that is not suited to the production of wine, while some are pre-eminently so, and, as stated in the beginning of this report, the land suited to it is not less than 30,000,000 of acres, an area equal to that of many an older State. All these counties have not as yet entered into the industry with spirit, but they will all fall into line one after the other, as the experience of farmers in adjacent counties encourages them. Los Angeles, which has had the honor of being the pioneer in the business, still heads the list, and in conjunction with San Bernardino, which adds a slight contribution, will lead off with 2,000,000 gallons this year. Making a big stride from this to the north of San Francisco Bay, we next meet with the fertile county of Sonoma, which will yield this year at least 1,300,000 gallons, distancing all other counties outside of the extreme southern section of the State. Napa, the neighbor of Solano, will send to market or store 1,125,000 gallons. The counties of Sacramento and Yolo,

equally rich and fertile, and near to a port of shipment, will not produce 750,000 gallons this year. Another county north of the big Solano will yield 600,000 gallons; one south of it, the fertile county of Santa Clara, will not fall behind its northern neighbor. The great wheat county of San Joaquin will market half a million gallons, while the two mining counties of Placer and Tuolumne will do as well as those just mentioned.

Turning again south, we find Santa Barbara producing a similar amount, while the balance of the counties in the State may be unitedly credited with nearly a million gallons in the aggregate. There are some very heavy growers in these counties; men who have made a special business of it, and many others who, while not growing largely, buy largely of those who do grow, and manufacture large quantities every year. Not all grape growers are fitted by nature or education to become wine makers, and not all wine makers, especially in California, are experts in vinticulture. Sonoma and Napa contain the largest number of large growers and manufacturers; the former county having five that range from 100,000 to 180,000 gallons a year, five that make 50,000 gallons and over, seven that make 20,000 gallons and over (the most of them over 40,000 gallons), and others of smaller dimensions. Napa has one wine maker who claims to produce a quarter of a million gallons every year, one who makes 125,000 gallons, four who make 50,000 gallons and over, and three who make 20,000 gallons and over.

One firm between Los Angeles and Sonoma counties claim to make half a million gallons yearly, while another in Los Angeles makes 100,000 gallons. Sacramento County boasts one who makes a quarter of a million gallons, and one of 70,000. Tehama has an estate producing 160,000 gallons a year, and San Joaquin is producing 100,000 gallons annually. Of champagne, there is made in the State about 50,000 gallons yearly, from natural fermentation, and a small quantity where artificial means are used. This we regard as a highly reprehensible practice, and calculated to injure the good name of California wines abroad. California could make a good deal of fine brandies, and that with much benefit to the viniculturists, were dealers afforded the same facilities of importers. The latter are allowed to keep the brandy in bonded warehouses for three years without the payment of duty, and it is an injustice of the grossest kind to refuse the same privilege to California distillers. It is more than that, it is a blunder, and it acts prejudicially to the best interests of the State. The two samples of California grape brandy shown at the Pavilion compared well, all things considered, with the samples of imported brandy, and show what California distillers can do to stop importation of foreign brands.

In taking leave of this subject we can only hope that California wine growers and wine makers will be more numerously represented by their products in the Fair of the coming year than they have been in that of the past.

EXHIBITS IN DIVISION VII.

The display of California wines was in every way creditable, and well sustained the reputation our young State has for excellence in this important product.

I. Landsberger & Co. Champagnes—sillery, dry, eclipse, private cuvée and muscatel.
Wines—reisling, hock, gherke, white, angelica, sherry and port.
Bitters—wild blackberry.

Lang & Co. Wines—muscatel, pearl, hock, white and catawba.
Whiskies—"old style" and "private stock," 1865.
The value of the raw material used per annum by this firm amounts to $30,000, all of which is produced here. Fifiteen men are constantly employed, and the manufactured products are worth $70,000 per year.

Lachman & Jacobi. Wines—port, sherry, mound vineyard, reisling, claret, white, angelica, zinfandel and muscat; grape brandy and wine bitters.

Chenery, Souther & Co. Green ginger brandy, "cedar run," whiskey, Jamaica rum, apple brandy, cognac and orange bitters.

Dr. Henley. I X L and "Dew of the Alps" bitters.

Dr. F. Renz. Blackberry brandy, herb bitters, bonanza whiskey.

Homer Williams & Co. Yerba Buena bitters (medicinal).

Gustave Mahe. Golden wine.

H. Palmer. Port wine.

Kohler & Frohling. Wines—claret, port, white, sherry angelica, tokay, hock and muscatel; grape brandy. The business of this extensive firm was commenced in 1854. The average number of hands employed is, in

San Francisco	20
Sonoma Vineyard	12
Los Angeles Vineyard	10
St. Louis	8
Total	50

Besides, they employ during vintage time, for about two months, over three

hundred extra hands and teamsters in the above vineyards. They press from three to five million pounds of grapes per annum in Los Angeles and Sonoma. The value ranging from ten to twenty dollars per ton, according to the quality and kind of grape.

DIVISION VIII.

Pomoculture and Horticulture.

California is a land overflowing with milk and honey. Her natural gifts are many and great, and amongst the greatest are her facilities for fruit culture. Placed almost, as it were, on the borders of the tropics—belonging at least to the sub-tropical section of the United States—she grows within her borders the products of the tropics and of the temperate zone. The orange and lemon groves of the south meet in her central section the apple orchards and peach groves of the north, and on the same ranch all the principal varieties of fruit common to both are successfully cultivated. In the matter of fruit culture, California is one of the most favored regions of the earth. Almost thirty millions of acres of land that are not suitable for wheat or grain culture, may be turned into one vast garden of the pomoculturist, and whether planted in vineyards or in orange, peach, apple, etc., orchards, can be made to yield at least $50 per acre. Were all these occupied, as assuredly in the distant future they will be, there could be gathered from them an annual crop worth at least one thousand five hundred millions of dollars, equal to three-fourths of the national debt, and nearly equal to the total yield of gold and silver, all over the coast, from 1848 to the present hour, and this only a yearly yield. In California fruit culture there is, therefore, illimitable wealth, more especially as our fruits, from their superior size and flavor, have obtained a high reputation all over the civilized world, and have been even inquired for and shipped to the epicures of England and France, not to speak of our brethren of the East, always ready to give a cordial welcome to anything that bears the name of California. It is to the Eastern States and Europe that we must look for the future sale of a great portion of our fruit crop, which as a rule will have to be sold abroad. We now speak of the future, for at the present time Oregon ships the greater part of her surplus apples, pears, and other fruits, to this market; we import oranges from Tahiti by the million, and draw largely on southern Europe for raisins, currants, dates, figs, and other fruits that might well be raised at home among us. We must first learn to supply ourselves, and having done that, we shall be able to devote a large portion of our time to the cultivation of relations with consumers in foreign nations, and with the importers in foreign cities. We must pay particular attention to our mode of culture so as to produce the best of the kind. Already California has distanced all competitors in the

matter of size, she must also seek to distance them in the matter of flavor. This is only to be done by diligent attention to the business of fruit raising. Pomoculture must become a science. To be proficient in it, the fruit grower must be able to compare his fruit with that of his neighbors, and with growers from other parts of the State, and the very best place to do this is at such an exhibition as has just been closed, where every county in the State, and every section of every county should be represented. Here the fruit growers would be able to compare notes, and to learn by comparison, as also to see what particular fruit each section of the State was best suited for. The buyer would have, as it were, a pomological map of the State spread out before him, and would be directed in his operations by the information conveyed thereby. Such an exposition we hope to see ere long, and no doubt will next year witness its inauguration. Did the farmers and orchardists of the State know its importance, they would be represented in thousands of the choicest fruits that they could raise. In the exhibition now closed there were five counties of the State represented by the fruits sent by as many exhibitors, which were just sufficiently fine in appearance and in flavor as to make one think what a splendid display could be made by the farmers of the State did they but bestir themselves. If they did so, hundreds would come from other States, on business or pleasure bent, to view at home those pomological wonders, of which they had heard and read so much abroad. The oranges, peaches, pears, apples, etc., sent in this year were no doubt fine enough, but we want finer ones and more of them.

California sends hundreds of thousands of dollars abroad every year for fruit. Let our fruit growers come to the exposition, send their fruit there, meet those who would be purchasers, and they will return home with a determination that neither Tahiti, Spain, Greece, or Asia Minor, will find a market three to eight thousand miles away for what they themselves should supply with their own markets at home. And having done this they would find that there were other commercial worlds to conquer. The people of the United States pay annually $16,000,000 for fruit, the greater part of which could well be furnished from California. A dozen different ports of the old world and the new are called upon to supply the markets of New York, Boston, Philadelphia, and Baltimore, with semi-tropical fruit, than for the production of which nothing is better suited than the soil and climate of California. The value of the foreign fruit imported into the United States last year is greater than was the value of the wheat exported from this city last year, greater than the value of the wine crop of the State last year, greater than the value of the wool crop, than that of the quicksilver yield; greater, in fact, than the values of two or three important products put together; and the quantity of fruit of this kind imported increases largely year by year. Scores of vessels are engaged in carrying oranges, lemons, limes and grapes to the city of New York alone. Europe and the West Indies produce fine fruit, no doubt, but Southern California produces oranges of seven inches in diameter, and favored spots in Central California nearly as large. We have some of the finest grapes in the world. They will not be all used to make wine. Over

900,000 boxes of raisins are imported by the United States every year; Spain this year produces 2,600,000 boxes; and raisin curing with us should become a profitable industry; and so it will when our raisin curers acquire more skill. The industry, young as it is with us, is already taking gigantic strides. Last year there were 20,000 boxes made in the State, and the foreign raisin trade was almost ruined. Imports of Malaga layer grew small by degrees and beautifully less, and some dealers who had hitherto dealt in nothing else ceased to import. The California raisins were found to be good for table use and cooking; they were cheaper than the Malaga fruit, and the people preferred them for that reason. This is a good beginning; it has given the raisin curers courage, and this year it is anticipated that there will be a large increase in the product, some placing the total as high as 40,000 whole boxes. It is certain that it will reach 25,000 or 30,000 boxes at least, and thus a most important interest in the State is set fairly afloat. The new raisins have already begun to make their appearance, and they compare very favorably with the imported product, and are in many instances a decided improvement over those of last year. Indeed, a house in this city, which is a large buyer of raisins, has made arrangements this year for the packing of a very large proportion of the crop in layers, after the Malaga fashion, and hope to produce a fruit fully equal, in all respects, to that imported from the famous old city of Spain. We cannot, of course, hope to equal in a day the skill that has been, so to speak, accumulating there for centuries; but time works wonders, and in the course of a few years, and by obtaining the assistance of skilled workmen from Spain, we may hope to come sufficiently near it, and to be able to compete in our home markets as well as in those of South America, Australia, China, and Japan. These are all large markets, or may be made so; thus we have in this single industry one most important member of that host which must ultimately go towards building up the future of the State.

There are two processes used in curing them; each of which has its advocates—one by artificial process, the application ot artificial heat, the other by drying in the sun. The latter is the method adopted in Spain, and is the one which will probably ultimately prevail, although the other has many advocates and defenders, and has already made a splendid showing; as witness the magnificent sample of fruit exhibited this year, prepared by the Alden Fruit Preserving Process. Indeed, the utility of this and similar processes to the State is unquestionable, and will be recognized even more in the future than it has been in the past. Just as soon as one or other of the processes comes into use, just so soon will there be a saving of millions of pounds of fruit yearly, that is now wasted or allowed to rot, either from inability to keep it, or from want of a market. Some of these processes are cheap and of easy application, and will no doubt soon come in common use among the orchardists of various parts of the country. It would be invidious to speak of particular methods, but some approach as near perfection as it is possible to do so, and some raisins that we saw prepared by one in particular, could not, in our opinion, be excelled in point of flavor either in the State or out of it; they seemed to all intents and purposes as fine as the very finest fancy layers ever seen in this

market. It is not easy to form an idea of the quantity of fruit dried in the State, as no statistics have ever been attempted to be kept on the subject, but it must be very large, as scores of boxes may be seen at a time preparing for shipment by single houses to various parts of the country. It has increased a good deal during the past year, as is evidence of the lower price now obtained. Oregon supplies every fall a considerable quantity, and this is constantly increasing. Outside of California and Oregon there is little done in this way on the Pacific Coast, but the industry is at present only in its infancy, the methods of drying have not yet received all the perfectibility that they are capable, and one State and Territory on the coast after another, will take advantage of it as a means of adding to its wealth, and opening up new channels for the employment of capital and labor.

The State pomologically considered unites within its borders the productions of the tropic and of the temperate zones. Southern California is the home of the orange, the lemon, the olive, and many other tropical fruits. It is even said that bananas will grow there. Orange culture is rapidly on the increase in Los Angeles and San Diego Counties; new groves are constantly being planted, and the fruit is unapproachable for size and flavor when its culture is properly attended to. Some have even been known as much as seven inches in diameter. Last year there was a rather short crop, yet nearly 3,000,000 were received during the season in San Francisco. This, however, is far from satisfying the wants of the market, as during the present season 4,802,000 have been imported from Tahiti alone. We have before averted to the quantity of fruit imported yearly into the United States; now of these, oranges form a very large proportion in value, and it is manifest that the cultivation will have to be much extended in California before our growers are able to satisfy the needs of our own land. There is, however, a necessity for growers to be more circumspect; to take better care of their trees, and not to sacrifice quality to quantity. Oranges are, of course, confined principally to the southern part of the State, but some of the finest we have ever seen were grown in a sheltered valley near Martinez. Of other fruits grown in the State, peaches are decidedly the most abundant and the finest. The crop this year exceeds that of 1875 by at least thirty-three per cent., it being the greatest known for the last ten years. A few weeks ago they came into this market in immense quantities, and some of extraordinary size. They sold cheaper than bread or meat, averaging one and a half cents per pound. They were bought up in immense quantities by the canners. They came principally from the Sacramento River Valley, and from the neighborhood of San José. Plums of various kinds, the green gage being the most common, come next to the peach in point of importance. They are a hardy fruit, and grow all over the State, but are particularly abundant near Petaluma and Napa. The crop this year is at least fifty per cent. ahead of that of 1875, and has sold at an average of one and a half cents per pound. We produce fine prunes, of which fruit the United States imports 220,000 boxes and kegs per year. The apple grows well all over the State, is in the market nearly all the year, and being hardy, bears transportation better than most other fruit. The best

apples come from the north of the State and from Oregon, but some think that those raised on the coast are not the equals in flavor of those grown in New York or New England. They sell very low this year in large lots down to one cent per pound. The market has this year been inundated with currants, which are grown principally in Alameda County, and are very fine. The crop of 1876 is at least a quarter greater than that of 1875, while the average price has been three cents per pound. From Napa, Alameda and Santa Clara Valley come blackberries, of which there were produced at least fifty per cent. more this year than last, and which sold at four and five cents per pound. Apricots showed no increase this year, and sold at two and a half and three cents per pound. Santa Clara, Napa and Sacramento Valley sent most of them to the market. The cherry crop is raised principally in Alameda, Napa and Oregon, and has been rather short this year, selling up to six and eight cents per pound. Gooseberries were also scarce. Alameda, Napa and the neighborhood of San José producing less than the usual quantity. Pears, particularly Bartlett pears, are very abundant this year, but the growing Eastern demand is sufficient to absorb all the surplus. The production of this magnificent fruit will become a leading industry of the State ere long. At present the chief sources of supply are Santa Clara and Sacramento River Valleys. The strawberry is a very profitable object of culture. Although a large crop was produced in the Santa Clara and Sacramento River Valleys this year, they are almost exhausted, and have averaged seven and eight cents per pound.

The canning of all these fruits, and of vegetables as well, forms a great and growing industry in this city, in San Jose, and in fact all over the State. A few years ago fruit packing was of rather insignificant proportions, but it has grown with gigantic strides. It taxes the energies of five large houses in the city, who employ in the season, from 1,500 to 2,000 hands. There is packed by them and the canners throughout the State, 200,000 cases yearly, of fruits and vegetables; 12,000,000 pounds, worth at least one million of dollars. Of the goods packed, at least one-half consist of tomatoes, which are purchased at about half a cent per pound, and for which Alameda County is the great source of supply. Considerable quantities of peas, beans, and other vegetables are put up in this manner also. Of the fruit canned, the greater part consists of peaches, they forming at least one-half of all the fruit put up by canners. The utility of preserving fruit in this manner may be estimated at its true value when it is known that recently a can which had been packed nearly ten years was, on opening, found to have its contents as well preserved as the day on which it was put up. There is a large and increasing foreign trade in our canned fruits, which ere long must assume quite respectable dimensions. This great industry was well represented in the Exposition, though we are sorry to say only one of our city or country firms availed themselves of the invitation of the Directors.

The horticultural display which was under the special supervision of the Directors, was a good one, but it was mainly the work of the Institute itself, but few contributions appearing. In this respect there remains great room

for improvement. Without taking much note of merely ornamental shrubs and trees, we think that this department should contain sections of every description of timber found on the coast, and labeled, showing where found and cost. In it also might be placed sections of hardwoods and other trees, such as the Blue Gum, with similar particulars as to their value, etc. All this, of course, in connection with the garden, which might contain plants of all kinds, either ornamental or useful, that could be grown in the State. The lumber supplies of the world are growing smaller year by year, and ere long, tree planting and growing will become a most important industry.

EXHIBITS IN DIVISION VIII.

The Welton Fruit Drying and Preserving Co. Samples of fruit dried by their improved and patented process, all of fine quality and good appearance.

The Alden Fruit Preserving Co., of California. Geo. W. Deitzler, Agent. California fruits and vegetables prepared by the Alden Process. The following description of the process and business, furnished by their agent, we deem of interest:

The Alden business was started on this coast in 1873, in a factory of five evaporators, at San Lorenzo, Cal. There are 52 evaporators in successful operation this season in Oregon and California, with a capacity of 5,200 tons, (100 tons per evaporator) of fruits and vegetables, in a season of say four months.

Their manufactures embrace all the fruits and vegetables suitable for human food; also, hops, tobacco, beef, food-fish, etc., all of which articles are produced here. They import no raw materials.

They employ about thirty boys and girls, or Chinamen, for each evaporator—1,560 altogether—and two superintendents for each factory. Any carpenter can erect an Alden factory, and any person of ordinary intelligence can manage, successfully, the Alden business, under the instructions which they furnish to purchasers of their apparatus. No skilled labor is required.

The value of the raw material used this season on this coast will reach about $208,000. The value of the finished or manufactured articles, at wholesale, will reach and probably exceed $624,000. We may add that the Alden business has passed the experimentel stage, and is now one of the established industries of the State, and capable of being extended to vast proportions. The chief difficulty, hitherto, has been found in the scarcity of the best fruits, etc., for preservation by this process—such as apricots, peaches, plums, prunes, nectarines, figs, raisin grapes, etc. According to the Surveyor General's report, there were over a million and a half of apple and only twenty-two thousand prune trees in the State in 1874. Wherever Alden works have been established the fruit business has received a new impetus, and since the first factory was started here, three years ago, thousands of acres of the finer varieties of fruit trees have been planted, so that in a few years more we shall

have apricots, prunes, plums, etc., quite as plentiful and cheap as apples. Fruit growing, in connection with the Alden process of preservation, is probably the highest and most profitable agriculture in California. To illustrate: One hundred and forty trees to the acre, and one hundred pounds of fruit to the tree, at one cent per pound for the fruit—a very low estimate—will yield $140 per acre, which is more than can be realized from wheat or stock raising. If the curing factory is located in or near the orchard, there will be no outlay for boxes, no freight, insurance, nor commission to pay, and there can be no loss from waste. These fruits—plums and prunes, for example—which yield one pound of cured from three pounds of fresh, can be cured and placed upon the market at an expense—for labor, fuel, boxes, etc.—of say three cents per pound, making the cost of Alden prunes, etc., which are infinitely superior to the imported articles, six cents per pound. Such articles could then be afforded at ten cents per pound, retail, which would be within the means of the poorer classes, and yet leave a handsome profit for the grower, the manufacturer, and the merchant. At present the factories pay from two to four cents per pound for such fruits, and sell the manufactured goods at from twenty to thirty-five cents per pound. Farmers are quite satisfied to sell their apples, at home, for one-half cent per pound, and they can afford to sell plums, etc., at the same price, and then make more money with less risk and labor than in any other branch of agriculture. A prune tree will not bear as many pounds as an apple tree, but an acre will carry more trees of the finer varieties named above than of apple trees, and the result in weight per acre is about the same, while, in point of commercial value, the difference is vastly in favor of the plums, prunes, etc.

It is claimed (and we believe no longer disputed), that the process increases the sugar in the fruits treated, which will save housekeepers nearly all the sugar which they now have to add to sun-dried fruits; that the goods are cheaper and more wholesome than canned goods, and superior to the fresh articles in richness and digestibility, and that they will keep for years in any climate. The packages are light and inexpensive, and the freight on goods, so condensed, is vastly in favor of the Alden preparations. To illustrate: one case of Alden peas, weighing 140 lbs., is equivalent to and will go as far as seven cases of canned peas, weighing 350 lbs. One pound of Alden blackberries, retail price 30 cts., is equivalent to 3 two pound cans, retail price 50 cts. per can—one pound against six pounds, and 30 cts. against $1.50. The same rule applies to all fruits and vegetables preserved by this process.

They have commenced to manufacture candied fruits, marmalades, fruit syrups, jellies, and also put fruits in glass jars and bottles, and expect to find a large and profitable business in that line, as an adjunct to their regular work. The people of the United States are now largely dependent upon the French for their conserves, etc., which sell for very high prices, but which might just as well be made here. Our California apricots, pears, etc., are larger and nicer than the French, and our manufactured articles are better and quite as attractive as the imported. It is the aim of the Company to stimulate the production of the finer varieties of fruits, and to place them

upon the market in all their various industrial preparations, and in all sorts of packages, except in tin.

They have met highly gratifying success in making raisins, and expect to place upon the market several hundred tons of Alden raisins, this fall.

The raisins manufactured last season by the Alden factory, at Jackson, in Amador County, found a ready sale in the east at sixteen cents per pound, currency. They have been examined by many competent judges, and all pronounce them superior raisins. They are clean and almost transparent, like the Huasco (Chili) raisins, and, as the miller is excluded during the curing process, they will not become food for worms.

In raisins cured by the ordinary methods the sugar exudes, forming little globules on the outside of the raisins, which soon become stale from exposure, and such raisins are hardly saleable after they have become one year old. No such exudation occurs on the Alden raisin. By our process the free water, which is the mischievous element, is removed so quickly that no fermentation can intervene, and the saccharine matter is completely jellied, and the raisins will keep for years; indeed, "age improves them decidedly."

Having briefly outlined some of the work and purposes of this company, from which it will not be difficult to discover the merits of the Alden process and its importance to the State of California, we conclude by urging the planting, on a large scale, of the finer varieties of fruits, such as apricots, peaches, nectarines, pears, plums, prunes, figs, blackberries, raspberries, raisin grapes, seedless sultana grapes, zante currants, etc. The conditions are all favorable for the production, in the greatest abundance, of such fruits, and we predict that in a few years California will supply the $25,000,000 worth of such articles annually imported into the United States.

C. James King of Wm. & Co. Preserved fruits and vegetables, jellies, jams, pickles, canned meats fish, champagne cider, etc.

Within a few years the business of preparing hermetically sealed goods has grown to great proportions in this city. Thousands of tons of fruit that used to be lost altogether to the grower from the lack of some means of preserving them, can now be sold for drying or preserving, or be prepared by the producer. The above firm have one of the largest and most complete establishments in the country. Their trade not only extends throughout the Pacific Coast, but thousands of cases are annually shipped to the Eastern States and foreign countries. Nothing but white labor is employed, thus giving employment to many of our boys and girls that would otherwise be idle. Their exhibit comprised samples of almost every fruit, vegetable or meat that is used for food, and being all home production and manufacture deserves, as was accorded by thousands of visitors, the highest praise, both for quality and general appearance.

Sweetzer & De Long. Pure cider vinegar and champage cider. The vinegar exhibited is specially commendable as being free from deleterious chemical compounds, and warranted pure.

In the HORTICLTURAL DEPARTMENT but few exhibits were made this year.

MILLER, SEIVERS & Co., proprietors of the Exotic Gardens on Mission street, exhibited a collection of ferns immediately in front of the steps, consisting of over seventy distinct species. In other parts of the platform they exhibited some thirty varieties of fuchsias, ninety varieties of cacti, yuccas, aloe, agavas and echeverias; fifteen specimens of coleus; twenty-five varieties of begonias; one hundred varieties of rare foliage plants, and several specimens of palms, tree ferns, draconias, arancarias, etc.; also a table of cut flowers, consisting of dahlias, roses, pinks, etc.

R. B. WOODWARD, from his celebrated gardens, exhibited a fine collection of foliage plants, consisting of draconias, caladeums, begonias and maranthas, and a good collection of tree and other ferns of numerous varieties.

The exhibition of fruit was from the orchards of

JOHN CROFTON, Sacramento River.
SOLOMON RUNYON, Santa Clara.
JESSE CHENEY, El Dorado.

The display of oranges was made by

D. E. HAYES, from his orangery in Santa Barbara Co.
R. T. VAN NORDEN, Bidwell's Bar, Butte Co.

DIVISION IX.

THE FINE AND LIBERAL ARTS.

How much civilization owes to the liberal arts we shall never know. Poetry, music, sculpture, photography, and though last, not least, the noble art of printing, are woven into the fabric of modern civilization—form the warp of it—while their subtle influences are felt in a thousand unnoticed ways, and penetrate the secret recesses of society by a thousand unseen channels. They are, therefore, very properly made the subject of a special exhibit, or rather their objects are, although were such a thing undreamed of, homage would still, within the walls of the pavilion, be paid to their teachings in a thousand different ways. In human life, utility is first sought after, but once utility is satisfied, then comes beauty, and all other things being equal, the article that shows the most beauty in elaboration will draw its rude competitors out of the market. But the expression of art is found in beauty; an

advance in the beauty and harmony of manufactured objects is an advance in art, and an industrial Exposition is therefore, if not technically, in reality, a competition of artists. And to excel in any line, the inventor or designer must be of an artistic turn of mind. The setting aside of a department devoted to the liberal arts is, therefore, at once paying a high homage to art itself, and trying to teach the lesson of the necessity of a more intimate acquaintance with the underlying principles of art amongst our artisans and workers. The success of a people to-day in the domain of manufactures is measured much by the practical acquaintances of the masses with the first principles of art. It is to this as much as to their innate taste and sense of beauty, that in certain manufactures, France stands unrivalled. Her artisans, and those under whose direction they work, are early taught the principles of art and their application, and on articles of beauty and *luxe* they stand unrivalled. The result of this is, that the productions of their workshops are sought all over the world, and for an article to be French is always to be stamped by that very fact as superior in itself. We, if we mean to excel, must follow in their footsteps, and must give our workers and superintendents an art education; an education in the principles of form and color and of harmonious combination. In fact, a system of instruction in the essentials should form a part of every good common school education. This might be supplemented by night schools, where those grown-up apprentices and workers might receive the benefits of such instruction. The results would be felt ere long, and the crowning of the work would be manifested in an industrial advance out of all proportion to our numbers and resources as a people. We could sell our goods where others could not, and could obtain better prices for them than competitors who did not pay attention to this very necessary branch of education. Thus for the more practical and utilitarian view of the subject. There is, however, another that regards art for its own sake, that adores the poet for his songs, the painter for the magic of his pencil and his brush, and the sculptor for the almost breathing forms that seem to spring to life and being from the rude block of marble under his chisel. Those who took either view could find much to please them in the late Fair. The beauty and artistic merits of many of the articles exhibited should please the one; the evidence of our growth from an artistic point of view, shown in the many meritorious paintings hanging on the walls of the Art Gallery, should gratify the other.

The riches with which this part of the world abounds, and the liberal manner in which it has been distributed amongst so many from so early a day in our history, should predispose our people to be liberal patrons of art. In early days, however, there was not so much thought of art in its true sense as there is now; pictures there were in plenty, it is true, but they were mostly imported, and in great part of the class that are made to sell, and in painting which to order scores of miserable hacks eked out a wretched existence in the garrets of London and New York. By degrees, however, taste for a better style of picture came into existence, but for a long time even then many rich men measured a picture by the number of square yards of canvas covered by it, or the quantity of all assorted pigments of glaring colors daubed over it. Happily, this class has for some time been stepping down and out, or becom-

ing better informed; yet there are still many rich men who on giving an order for a picture leave it to be understood that they must have a big one. However, despite of all these and other drawbacks, the art of painting flourishes well in San Francisco, and the numbers of its votaries are increasing daily. Our peculiar circumstances have almost given birth to a new school of art amongst us. We have but few historical events to commemorate, but few great men whose memory is mellowed, and all its harsh lines softened by the mists of years, to portray, and no edifices of historical celebrity, the very dust of which was hallowed. But we had to our hand all of the great and wonderful in nature—mighty mountain chains among the highest and largest in North America, beautiful lakes, wondrous canyons, forests that have waved since the creation, broad rivers, extended plains, a magnificent coast line, and a thousand other things, which furnish material for the painter as well as the poet. All of these have been taken advantage of, the result being the building up of a school of art possessing characteristic features of its own; and every part of the coast is being limned with an almost perfect fidelity to nature. Lake Tahoe, Donner Lake, the various wonders of Yosemite, and other notable localities on the coast have been painted each from a dozen different points of view, and almost every new painter thinks it necessary to have done one or two of these in the usual manner. This is a distinguishing feature of the school of art growing up by the shores of the Pacific, though of late many of our painters are beginning to stray off a little from the beaten track. Each of our old painters is also striking out in a new direction for himself. Thos. Denny is our marine painter *par excellence*. Coulter follows in his footsteps. Brookes is a painter of what has been called still life, reproducing, with the utmost fidelity to nature, fruit, game, fish, and their various accessories. Nahl, Irwin, Shaw, Harrington, and others, confine themselves to figure and portrait painting. Tojetti, a painter of historical and legendary incidents. Frost, a name happily chosen, who excelled in Arctic scenes. Deakin, noted for his rich, warm coloring. Bierstadt, the former faithful painter of our natural wonders; and Hill, Williams, Marple, Hahn, Keith, Tavernier, Narjot, and others, who, with a wonderful fidelity to nature, have reproduced on canvas, unnumbered Pacific Coast scenes, by field and flood, and who in that way spread abroad the fame of our natural wonders. These, and a few others of late coming amongst us, reflect no little glory on the artistic fame of our coast, and promise even better things for the future. It would be invidious, and indeed it would not become us, to criticise individual pictures, bestowing praise here or censure there; suffice it to say, that while there were some works of remarkable merit, there were a few that show the authors have not yet reached the summit of perfection in the art that has charmed and delighted the world since the day when the birds came to pick at the grapes painted by the renowned Grecian artist, Apelles. Most of all our prominent artists were represented by three, four, and five pictures. One or two did not send in anything. There were altogether two hundred and twenty pictures, many of which would have taken a high place even in the most renowned art galleries of Europe.

Besides these, there were twenty pictures in oil, and twenty crayon drawings

by the pupils of the School of Design, which gave great promise of the future of that institution. This, founded by the Art Association, with Virgil Williams as its Director, is in its sixth term and third year, and at the present time numbers fifty-seven pupils, who study from models in the rooms of the Art Association, and who are in all stages of progress. The Director has delivered courses of lectures on the principles of art time after time, and so far, the school has been a great success. There is, however, an obstacle to its reaching the full measure of its utility, which should hardly be allowed to stand in the way in so rich and public-spirited a city as San Francisco, and that is, want of the means of paying the fees charged for tuition on the part of many. Tuition in the School of Design should be free, and San Francisco should have citizens wealthy enough, and sufficiently public-spirited, to supply the means to provide such a school with a staff of teachers, and a sufficiency of models and other means of instruction. The result can hardly be estimated. To this school could come all who wished to learn—none possessing natural genius for art need excuse their failure to study on grounds of penury—the tares would be separated from the wheat, and eventually the school would send forth a long line of illustrious painters, and add dignity and honor to this city, as have the great schools of painting in Europe to the cities which claim them.

Of statuary, there was a considerable number of exhibits—bronze and iron being the more numerous. Of these, the majority were very beautiful—true works of art, and testify to the high perfection which the industrial art has attained in Europe, whence most, if not all, the specimens came. And here it strikes us that from a strictly utilitarian point of view it would be well to encourage this art here, and save the hundreds of thousands of dollars that are annually sent abroad to procure bronze, etc., statuary to adorn the homes of the wealthy. The plaster casts in the exhibition of Pietro Mezzara, the California sculptor, have been exhibited before, have been noted by the press before, and do not need special mention here. We have in this city many men who are skillful with the chisel, and who possess the soul of the true artist, but there is not sufficient scope for their talents in San Francisco. Let us hope, however, that this will not long have to be said of the Golden City. Notable in the Art Gallery of the Pavilion was one group of statuary that had come all the way from sunny Italy, after having been first exhibited in the International Exposition of Chili. It came from Milan, and represented the work of four different sculptors. The execution of the different figures was admirable beyond description, and they would, indeed, well serve as models to those of our young art students to desire to emulate the creations in marble of Phidias, Praxiteles and Michael Angelo.

The continual improvements that are being made in the art of phtography were evidenced by the splendid gallery of photographs of all descriptions that were sent thither by the prominent photographic artists of the city. From their merit it is sufficiently shown that the boast of San Francisco, in the photographic art being at the head of all other cities in the United States, is not by any means an idle one. The views of Central America by a veteran

of the profession, were especially fine, and fraught with interest to those who have so often read, but never seen, the localities and objects thus sun pictured. As a business, photography in San Francisco is quite an important one, and greater in value than some notable manufactures, equalling $350,000 annually. We question, indeed, whether any city in the United States can, in proportion to its size, make a similar showing. The photographic exhibit was, indeed, upon the whole, one of the most satisfactory made in the Pavilion.

And now come we to printing, the art preservative of all other arts. If the skill of the painter or of the sculptor preserves the lineaments of the soldier, the priest, or the statesman to all time, what shall we say of the art that preserves the best thoughts of all the best men of the world? Well is it called the art preservative. Like many other things it is young in San Francisco, but young as it is, it shows work with which the members of the craft in older cities than San Francisco might feel proud to vie. The specimens of lithographic printing by two prominent publishing houses of the city, equaled anything that could be produced in that line in New York, Boston or Philadelphia. The same may be said of the book printing of the same houses. Outside of them, however, there is some splendid book work done in this city, and indeed, San Francisco is notable for the excellence of her work in that line. Taken as a whole, the printing business in San Francisco is both profitable and creditable to those who follow it. The printing and publishing of newspapers forms, of course, the greatest part of the printing business in the city, that is so far as value is concerned, but they made little sign in the Pavilion. The *Chronicle* exhibited two of its plates used in the interesting process of stereotyping, while the *Journal of Commerce* made an exhibit of the products of the State and County, and covered an octagon with a vast array of commercial and industrial facts and figures, and gave as well, a list of the principal newspapers of the city, the date of their foundation, and the names of their founders. The *News Letter* exhibited samples of its labors in the journalistic domain. The magnitude of the printing and newspaper business of the city is great, its value being estimated at not less than three million dollars per annum, while it gives employment to many hundreds of men, boys and women.

So closely connected with printing as hardly to be dissociated from it, is the art of book binding—one of the oldest of the liberal arts known. It has arrived at great perfection in this city, and our craftsmen are sufficiently skillful to work with the best of those to be found in any city in the country. Specimens of their work calculated to bear out this assertion, might be seen in the gallery of the Pavilion. The business of book binding in San Francisco is quite important, though a great deal of blank books, etc., are imported from the East. It is valued at $320,000 yearly, while it gives employment to not less than 170 persons.

On the whole, the managers have reason to be satisfied with what was done in this department, but it is to be hoped, nevertheless, that the exhibit of 1877 will throw far into the shade that which is now a thing of the past, the one of 1876.

EXHIBITS IN DIVISION IX.

The entire management of the Art Department, as regards paintings in oil and water colors, was left to the Art Association of this city, who kindly consented to take charge of the same, and appointed from their members Pietro Mezzara, Edwin Deakin, Samuel M. Brookes, Benoni Irwin, and Scott Tidball as a committee to take charge of the matter, with J. Ross Martin as Superintendent. The committee devoted much time and labor to their duties, and the fine display of works of art attest the result of their work. The difficulties, time and labor attending the loan, collection and hanging of so many pictures as were exhibited this year can hardly be realized.

The Board of Managers are under great obligations to them for their gratuitous and disinterested labors, except for the advancement of art, and feel that the success of that part of the Exhibition is entirely due to their efforts. Following is the report of the Committee (for list of exhibitors see Art Gallery Catalogue, page 90):

To the Board of Managers:

GENTLEMEN—We may, without fear of being taxed with partiality, consider the last exhibition of the Art Gallery at the Mechanics' Fair, as the best ever presented to the public of San Francisco.

The local artists and the contributors have rivaled each other; the first named with zeal, and the second with good will; and, it is a positive fact, that the average of the paintings composing the last exhibition was far superior to those which had already preceded it.

Among the works of the local artists, landscapes were, as usual, to be placed on the first rank. Thomas Hill sent us his paintings of "The Great Master." W. Keith, and E. Deakin also sent us works to be noted for their great merit; J. Tavernier, whose compositions are so peculiar and attractive, would have required a critic of the first order to analyze them; Norton Bush, W. L. Marple, R. D. Yelland, etc., etc., were also well represented.

Compositions of "*genre*" and history were justly admired, and had been sent principally by W. Hahn and A. de Succa; portraits of great merit were seen there, signed by S. W. Shaw, E. Narjot, B. A. Fagioni and others: marines were sent also by the talented J. Hamilton, G. J. Denny and others; C. Nahl had some of his dramatic compositions, such as "The Dead Miner;" a remarkable study from nature could also be found, signed S. M. Brookes; and many others whose names we may have forgotten involuntarily.

As contributors, we had Dr. H. H. Toland, who sent us a real gem by W. Bradford; the Chamber of Commerce, who sent two beautiful portraits by S. W. Shaw; Irving M. Scott, who sent his magnificent painting of the "Gipsies' Tent," and many others, among whom were Tiburcio Parrott, D. J. Oliver, E. Bosqui, A. S. Hallidie, A. G. Hawes, W. A. Knapp and many others.

The Art Association and the Mechanics' Institute owe special thanks to those gentlemen, whose good and disinterested willingness have contributed so largely to our success.

We must not forget to mention the large fresco painting signed M. Strauss. This was the first work of the kind ever exhibited, and its effect was very satisfactory.

The department reserved for the drawings of the pupils of the School of Design of the Art Association, deserves a special mention. The crayon studies, as well as the oil paintings, do honor not only to the skillful Professor of the School, Virgil Williams, who has presided over the works, but also to the pupils, for it shows on their part remarkable dispositions, and we can say, without exaggeration, that that department was one of the attractions of our last exhibition.

It is indispensable to mention here the kindness, liberality and good-will of the Managing Committee of the Mechanics' Fair; they have placed themselves at our disposal for all that was reasonably possible in which they could help us in the arrangement of the gallery, in view of making our exhibition a success.

Our thanks, also, are due to John Ross Martin, Assistant Secretary of the Art Association, who had, at our request, been appointed Superintendent of our department, and who has in a great way warmed up the zeal of our contributors, and caused by his entreaties the success of our undertaking.

Before closing this brief report, I will take the liberty to submit a few remarks to the Board of Directors of the Exhibition.

Experience has shown us in an unquestionable way that at all the Exhibitions the Art Gallery has always been one of the greatest attractions for the public. It was there that the *elite* liked to meet; and, if it was permitted to establish categories, we would say that the Art Gallery has invariably been the select part of the Exhibition.

Until now, to say the truth, the local artists have received no particular encouragement at the hands of the Committee of the Mechanics' Fair.

It would not only be *just*, but also for the good of that Society, to interest the local artists (only those residing *here*) in a special way, to have them contribute to the next Exhibition, and make of it a *real* competition for all of them. To reach this, we might suggest the following plan: Six months previous to the opening of the Exhibition, the committee could publish a notice of a *great competition* of the local artists, to take place at the next Fair.

There would be given to the one on whose painting (in whatever "*genre*" or composition it might be) the greater attention and praise of the public had been placed, a premium of $300 to $500, in gold. A first medal in gold, and a second in silver, might be awarded besides to the different "*genre.*" The different styles might be classified as follows: 1st degree, history; 2d degree, "*genre*"; 3d degree, portrait; 4th degree, landscape; 5th degree, marine; 6th degree, animals; 7th degree, still life; 8th degree, water colors.

It is incontestable that such a competition, carried under such conditions, would be an act of justice to the local artists, as well as a great attraction to the public; and we doubt not but the Mechanics' Fair would also find it to its advantage.

We will recommend the members of the Art Committee elected for the next

Exhibtion to be very strict in the admission of paintings in the Art Gallery, for it is the only department where parties do not fear to send works often ridiculous, which mar the effect and entire success of our Exhibitions. There are, unhappily, many persons among the public, who (in view to get a brevet of connoisseur) seem to be attracted by very poor paintings, and, by such means, leave very good ones unnoticed. This is a fault that must be avoided, and we earnestly beg the Committee to remember, for the future, that they had better have on exhibit a few *good* paintings than fill up the Gallery from ceiling to floor with very poor ones. We would like, in fact, to have it well understood, that the fact of having had a painting admitted at the Exhibition would be considered by all as a *Diploma of Merit*, and not as a favor granted to all.

Respectfully yours,

PIETRO MEZZARA,
Chairman of Committee.

Bradley & Rulofson. Photographs, plain and retouched, crayons, landscapes, etc. As at previous exhibitions, their display was the largest, and contained over three hundred specimens of almost every style and finish known to the art. This firm has always been foremost in endeavoring to make the photographic department of our exhibitions worthy of the reputation California has obtained for superior pictures.

Robert A. Marden. Photographs, plain and retouched. A group, consisting of the Chief Engineer and assistants of the San Francisco Fire Department, was particularly noticed for its fidelity to nature, good posturing, and artistic finish.

E. J. Muybridge. Photographs of Central America. Illustrating its scenery and the industrial pursuits of its inhabitants.

For judicious selection of subjects, artistic taste and skillful manipulation, this artist has for many years stood at the head of his profession. An award was obtained by him at the Vienna exhibition, though in competition with the most celebrated photographers of all nations, for his exquisite landscape illustrations. These last productions of his camera surpass all his previous efforts, and their examination renders it difficult to believe, that with our present knowledge and taste, photography can make much further progress towards absolute perfection.

Arthur Nahl. Crayopaques. A collection of portraits done by a new style of photo-drawing; invented and patented by himself.

Emily R. Eastman. Colored photographs. A large and comprehensive display.

Miss Lena Lawton. Colored photographs.

Mrs. M. Gillen. Colored photographs.

Mrs. Commary. Colored photographs.
All the above were creditable specimens of artistic coloring.

A. Hossack. Oil Paintings and crayon-drawings.

Reigle & Wells. Silver-type pictures.

W. D. Dyer. Photo-chrome pictures.

Conklin & Co. Stereoscopic pictures.

H. C. Langhrer. Mechanical drawing.

M. Sutton. A rhinoceros and crocodile, nearly life size, made from cement, and colored to present a life-like appearance. They were placed in the garden.

S. C. Bugbee & Sons. Architectural drawings, with sectional views. The one of the Grand Opera House was particularly noticeable for clearness of detail.

J. W. Bones. Architectural drawings of the Memorial Hall at Philadelphia.

A. Van Der Naillen. Specimens of architectural, mechanical and topographical drawings, done by pupils at his school of civil and mechanical engineering.

Mrs. Buttleman. Two medallions or raised portraits; very clever in execution and life-like in appearance.

Mrs. W. Ireland. Paintings in water colors.

Mrs. Dr. French. Paintings in water colors.

W. C. Quinby. Marble statuary. This exhibit consisted of six pieces; representing Infancy, Inocence, Modesty, Prayer, Unconciousness, and the "Washing Girl of Milan." They occupied the central portion of the middle room of the galleries, and formed a very beautiful and attractive feature. They were imported from Italy by the exhibitor, and are the works of Argenti Angelo, F. Del Negrof, Antonio Argenti and Antonio Mollo.

Miss Jennie E. Clark. Oil paintings, Suisun Bay and Yo-Semite Valley.

Miss Westwater. Oil painting, "Magdalen."

A. L. Ballou. Oil painting, "Thomas Paine."

Capt. D. Brown. Oil painting by Roger Van Der Laden in the year 1698. This was the altar piece of the old Mission ship "Don Carlos," which arrived on this coast in 1771. As a relic of our early history, it would seem that the Hall of the Pioneers would be the proper place for its reception.

Heald's Business College. A large and fine display of pen drawings and specimens of penmanship, the former being especially worthy of mention.

L. K. Mihills Pen drawings and penmanship. The former were very poor specimens.

D. S. Dow. Specimens of penmanship and pen drawings.

Chas. W. Deaves. Specimens of poster engraving.

B. C. Vandall. Copies of "Bishop's Directory," of this city, for 1876, carefully compiled and well arranged.

J. H. Gilmore. A model, showing an emigrant family crossing the plains. This possessed considerable merit, the topography and figures being natural and life like, and was particularly appreciated by the forty-niners. The name of the artist of this exhibit could not be obtained.

Dewey & Co. Exhibited a printing press in operation daily, printing thereon the "The Mechanics' Fair Daily," of which many thousands of copies were distributed every evening. The practical operation of printing, as shown in this exhibit, was interesting and always well patronized by visitors, many of whom for the first time saw in motion the great lever that moves the civilized world.

They also exhibited bound volumes of the "Fair Daily," of which this is the seventh year of publication; of the "Scientific Press" from 1860, and the "Pacific Rural Press" from 1870.

This firm has been indefatigable in its endeavors to publish a paper suitable to the wants of the mining and mechanical interests of this coast, as also that of the agriculturalist. The "Scientific Press" and the "Rural Press" have met those requirements, the information gained through them being of vast importance to our State and population, and certainly confer honor on the proprietors who, by perseverance and ability, have placed them on the list of "honorable and successful newspapers."

San Francisco Journal of Commerce made an exhibit that was entirely novel and striking. A revolving octagon, 12 feet in diameter and 12 feet high, presented to the eye of the spectator, as it turned, views of San Fran-

cisco at three different epochs in its existence—in 1834, 1848 and 1876, and serried columns of figures, compiled at great labor and expense, showing the population and productions of the State and coast for the past; the total additions made in the principal products of the coast to the world's wealth since 1848; the principal figures connected with the commerce of the port for this and a few years past; the manufactures of the City, State and coast, and the values of the principal articles manufactured; and our neglected resources, illustrated by figures giving the values of a great number of articles imported that might be produced or manufactured amongst us. Samples of cereals, the product of the coast and of all points of the world besides; of wool, the products of California and Oregon; of cotton, the product of California and the South Sea Islands; of beet and other sugars; of Oregon and California pig iron and iron ore; of flax, hemp, hops, and polished slices of various descriptions of useful and ornamental woods, etc.; which served as an illustrative supplement to the facts and figures on the octagon, while the list of principal newspapers of San Francisco, names of founders, and dates when founded, furnished information about the facts seldom attainable.

A. L. Bancroft & Co. Specimens of lithography, zincography, book, card and colored printing, book stationery, and book binding; the latter exhibit comprised numerous specimens, from the costly album and elegant gift books, down to the plain law book, and all done in the highest and most artistic style and finish known to the book binder's art. This firm has one of the largest publishing, book binding, printing and stationery establishment on this coast, and their exhibit shows but a tithe of the specimens of the vast amount of stock kept on hand. They also made a fine display of school furniture and apparatus. (See Sec. 4.)

H. S. Crocker & Co. Stationary, blank books, specimens of printing, etc. These gentlemen conduct one of the few stationery establishments on this coast that does its own printing, and manufactures its own books, thereby enabling them to fill a special order at short notice on reasonable terms. They make a specialty of gloss label printing, of which they exhibit numerous specimens.

A. Roman & Co. Stationery, annuals and gift books, in fine bindings; blank books, specimens of fine card printing and engraving; globes, etc. Also, school furniture. (See Sec. 4.)

Frederick Marriott. Engravings. "Men we Know." These engravings, 9x12 in size, consisted of seventeen portraits of the most noted men of this city, originally published by the *San Francisco News Letter*, a weekly sheet, and given gratuitously to its patrons.

A. J. Burgen. Engraving on Glass. This gentlemen gave a practical illustration of the art during the exhibition, by engraving names, monograms etc., on goblets, door plates, or other articles.

Robert Samisch. Painting on porcelain. The facile brush of this artist was kept busy during the Fair in embellishing cups, vases, etc., with names and devices, and in which he showed a thorough knowledge of the art.

Mrs. Townsend and Miss Schnegass. Artificial flowers. These ladies gave a practical illustration of how nearly art can rival nature, as many of the wreaths and bouquets made by their skillful fingers were taken for the real.

Mme. Morrow. Royal chart and bazaar patterns for ladies' and children's garments. Mme. Morrow gave a practical illustration of her system of cutting and fitting, and no doubt was well repaid, as her exhibit was examined with much interest by the ladies.

Mrs. Ralph. Charts for cutting garments. Another system whereby anyone with ordinary intelligence can cut and fit dresses, cloaks, etc.

Domestic Sewing Machine Co. Domestic paper fashions and paper trimmed suits. This fine and elegant display of a comparatively new and increasing industry, was greatly admired by the ladies, and no doubt well repaid, by increased patronage, the expense and labor of the exhibit.

Mrs. Alwina Mangenberg. Needlework pictures—"Boar Hunt in Algiers," and "Night and Morning."

Mrs. Borman. Needlework picture—"Death of Douglas."

The above exhibits of needlework might be truly termed artistic, as the happy blending of colors and good drawing (which is often disregarded) gave them a life-like appearance.

There were many other exhibitors of articles of needlework, for which see catalogue of exhibits.

PUBLIC ANNOUNCEMENT

OF THE

TWELFTH INDUSTRIAL EXHIBITION

UNDER THE AUSPICES OF THE

Mechanics' Institute, San Francisco.

The Board of Managers have the honor to announce that the Twelfth Exhibition will be opened to the public on TUESDAY, AUGUST 7, 1877, and continue open for at least thirty days thereafter.

The Exhibition will be held in the Grand Pavilion, Market, Eighth and Mission streets, and easily accessible by six lines of city cars.

The building is 200 feet wide, 550 feet long, and 100 feet high, with a gallery around the inside fifty feet wide, besides a promenade sixteen feet wide and 1,000 feet in length, from which an unobstructed view of the interior is obtained.

In addition to the above space there will be an exotic garden, 70 by 200 feet, for the display of the fruits and flowers of this coast; also, a mechanical annex, 200 by 50 feet, for the display of special machinery.

A large and powerful engine will furnish the motive power for all machinery required to be in motion, while steam and water will be supplied in ample quantites to such machines or appliances as require them. The main line of shafting is 500 feet in length, with sufficient pulleys for all requirements.

The Art Gallery is 400 feet in length and 50 feet wide, well lighted by skylights during the day and at night by the most improved reflectors. It will be made specially attractive, both in pictures and statuary. Many noted works of art are already promised, and it is confidently expected this department will excel anything ever before seen on this coast.

Over 6,000 gas lights will be used to illuminate the building during the evening.

Four thousand seats will be provided for visitors. Also, a first-class restaurant, where refreshments of all kinds can be obtained at moderate prices.

A grand Instrumental Concert will be given each afternoon and evening by an orchestra composed of the best musical talent obtainable, and under the leadership of an experienced and popular conductor.

PREMIUMS.

In accordance with the general request of exhibitors, the management have decided to offer liberal premiums at this Exhibition, consisting of medals and cash, all to be for the FIRST DEGREE OF MERIT ONLY.

The medals will be of a new design, similar to those awarded at the late Centennial Exhibition.

A carefully prepared classified list of premiums has been published..

Articles may be entered for competition or for exhibition only; if for the former they must be so designated when placed in position.

It is important that all parties intending to contribute to this Exhibition should give early notice of the amount and kind of space required.

A copy of the premium list, blank applications for space, rules and regulations, and any information regarding the Exhibition, will promptly be given or sent by addressing the Secretary of the Twelfth Industrial Exhibition, San Francisco, Cal.

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